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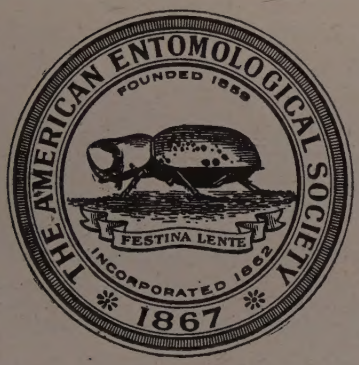

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LIST OF PAPERS

BRADLEY (J. CHESTER)

A Preliminary Revision of the Pompilinae (Exclusive of the Tribe Pompilini) of the Americas (Hymenoptera: Pompilidae) 23

(Issued July 31, 1944)

CRESSON (EZRA T., JR.)

Synopses of North American Ephydridae. Ia. Supplement to Part I on the Subfamily Psilopinae. II. The Tribes Hydrelliini, Hydrinini and Ilytheini of the Subfamily Notiphilinae, with Descriptions of New Species (Diptera) 159

(Issued November 10, 1944)

REHN (JAMES A. G.)

A Revision of the Locusts of the Group Hyalopteryges (Orthoptera: Acrididae) 181

(Issued December 22, 1944)

REHN (JAMES A. G.) AND REHN (JOHN W. H.)

Studies of Certain Cyrtacanthacridoid Genera. Part II. Prumnacris, a New North American Genus of Holarctic Type. (Orthoptera: Acrididae) 1

(Issued June 5, 1944)

TINKHAM (E. R.)

Sinochlora, a New Tettigoniid Genus from China, with Description of Five New Species (Orthoptera) 235

(Issued January 29, 1945)

119
L.P6

TRANSACTIONS

OF THE

AMERICAN ENTOMOLOGICAL SOCIETY

VOLUME LXX

STUDIES OF CERTAIN CYRTACANTHACRIDOID GENERA (ORTHOPTERA: ACRIDIDAE)

Part II

PRUMNACRIS, A NEW NORTH AMERICAN GENUS OF HOLARCTIC TYPE

BY JAMES A. G. REHN AND JOHN W. H. REHN

Department of Insects, Academy of Natural Sciences of Philadelphia

(Plates I and II and text figures)

The first number of this series of studies appeared in these "Transactions" for 1939, under the subtitle of "The Podisma Complex."[1] A general outline of the purpose of the series was then presented, and it was our intention to follow that study at reasonable intervals with other contributions along the same lines. To date much of the base work has been completed on a considerable number of these parts. However, the present world situation has materially delayed the original schedule, and we have been compelled to postpone the final work on at least certain parts of comprehensive scope. Critical North American studies falling within the planned scope of the series, however, have been or very shortly will be completed, and the first of these is here presented.

The present study deals with an extremely interesting but previously undescribed North American genus, although its type species has been known for over thirty-five years. Aside from the

[1] Trans. Amer. Entom. Soc., LXV, pp. 61–96, pls. VI–VII.

original description of that species the literature is a virtual blank. It has been possible, from the very extensive material now assembled in the Philadelphia collections, as well as from considerable field experience with the genus, to determine and discuss its relationship and probable origin, its areal and zonal distribution, and the major features of variation of its type species, and also to discover a most unusual sexual dimorphism in the males of that species.

We wish to acknowledge the assistance we have received from the American Philosophical Society through the medium of a grant from its Johnson Fund, which aided in assembling certain of the material here studied.

PART II. PRUMNACRIS, A NEW NORTH AMERICAN GENUS OF HOLARCTIC TYPE

In the northwestern United States and adjacent Canada occur a number of species of ground-dwelling apterous, or at least flightless, locusts largely restricted to boreal or alpine conditions, which have variously been referred to the genera *Bradynotes* or *Asemoplus*. A comprehensive examination of the species of *Bradynotes* now nearing completion, as a section of an analysis of the genera of the Melanopli (Podismini of numerous authors) of holarctic affinities, has made evident that a number of errors exist in the current generic assignments.

It is now clear that *Asemoplus* is a sharply characterized and very distinctive genus, and that aside from its genotype *A. montanus* (Bruner), probably all those species which in the literature of the last half century have been referred to it are quite distinct generically, and representative of other phyla of the Melanopli.

In 1907 our old friend, the late A. N. Caudell, described from Mount Rainier, Washington, a species which he called *Asemoplus rainierensis*. This is the insect on which the very distinctive new genus here characterized has been erected.

PRUMNACRIS [2] new genus

This very distinctive genus is more nearly related to the east Siberian and Manchurian genus *Prumna* Motschulsky [3] than it is

[2] From Prumna, *an Old World locust genus,* and ακρις, *a locust.*

[3] Études Entom., VIII, p. 11 (1859). Genotype (by monotypy).—*P. viridis* Motschulsky (= *Podisma primnoa* Fischer de Waldheim).

to any other known. It is in fact so closely related in some respects that if the male appendages were disregarded the genotype might be placed in *Prumna* by some students. However, the male appendages, both external and internal, show excellent differential features, and while the fundamentally common ancestry of the two genera is evident, they are quite distinct.

From *Prumna*[4] the present genus differs in the prominent but bluntly conical, instead of smaller and more acute, prosternal process in both sexes; in the more normal sublanceolate, instead of short trigonal (*primnoides*) or short and blunt but heavily sculptured scutellate, supra-anal plate of the male; in the more normal, relatively narrow cup-like subgenital plate of the same sex, instead of the transverse, strongly bullate, laterally ampliate and tumid type found in *Prumna;* and in the aedeagus of the internal genitalia of the male lacking a lateral pair of ventrad directed, arcuate appendages springing from the dorsal point of the aedeagus, as found in *Prumna* (see fig. 19).

With *Prumna* this genus shares essentially the same type of fastigial development in both sexes, the same general shape and

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[4] We have before us the following material of the genus *Prumna:*

P. primnoa (Fischer de Waldheim) Genotype. (Figs. 19 and 20.)
Amginsk, Yakutsk, Siberia; VIII, 14, 1925; (Bianchi); 1 ♂, 2 ♀; [Hebard Cln. and A.N.S.P.]. (Determined by E. Miram.)
Verkhne-Udinsk, Transbaikalia, Siberia; VI; (Parshine); 1 ♂, 1 ♀; [Hebard Cln.]. (Determined by S. H. Scudder.)
Sryetensk, Transbaikalia, Siberia; VII, 21, 1927; 2 ♀; [Hebard Cln. and A.N.S.P.]. (Determined by Bey-Bienko.)
Eastern Siberia; 1 ♀; [Hebard Cln.]. (Ex Geneva Museum.)
Maritime Province, Siberia, 44° 30′ N., 133° E. of Greenwich; VI, 22, 1910; (N. Ikonnikov); 1 ♂, 1 ♀; [Hebard Cln.]. (Determined by Ikonnikov.)
Khingan Station, Manchuria; VIII, 5, 1925; (P. A. Parlov); 2 ♂; [Hebard Cln. and A.N.S.P.]. (Determined by Bey-Bienko.)

P. primnoides Ikonnikov
Yakovlevka, vicinity of Spask, Ussuri Region, Siberia; VI, 25, 1926; (Filipjev); 1 ♂; [Hebard Cln.]. (Determined by E. Miram.)

P. ussuriensis Tarbinsky
Yakovlevka, vicinity of Spask, Ussuri Region, Siberia; VI, 14 and 25, 1926; (Filipjev); 1 ♂, 1 ♀; [A.N.S.P.]. (Determined by E. Miram.)

P. polaris Miram
Yakutsk, Siberia; 1 ♂; [Acad. Sci. Leningrad]. (Determined by E. Miram.) Specimen loaned.
Kur-Juyach, Werchojansk, Upper Yana, Yakutsk, Siberia; VIII, 8, 1927; (Tkatschenko); 1 ♀; [Acad. Sci. Leningrad]. (Determined by E. Miram.) Specimen loaned.

proportions of the head, the same basic form and sculpture of the pronotum, and also of the caudal femora. In certain features *Prumna primnoides* and *P. polaris* are closer to *Prumnacris* than is *Prumna primnoa,* notably the exact shape of the lateral lobes of the pronotum. As the few males of these two species now available have not had their internal genitalia extruded, hence until more individuals are available we do not wish to imperil them by the possibility of damage in carrying out this operation. In consequence we have not compared these structures as developed in *primnoides, ussuriensis* and *polaris* with those of *Prumna primnoa* or of *Prumnacris rainierensis.*

When *Prumnacris* is compared with *Asemoplus* (Figs. 7–10, pl. I, figs. 13 and 14, pl. II, figs. 16 and 18) and *Bradynotes,* melanoploid genera occurring in the same general area of North America, it is found to differ from *Asemoplus* (*A. montanus*) in the proportionately smaller and more compressed head; in the more produced and trigonal, rather than strongly transverse, fastigium as seen from the dorsum; in the narrow frontal costa, which at least in part is well sulcate, instead of nearly (♂) or quite (♀) nonsulcate as in *Asemoplus;* in the subdeplanate pronotal dorsum and the indication of definite yet rounded lateral borders to the pronotal disk, instead of the transverse arcuate disk broadly passing without any appreciable "shoulders" into the lateral lobes, as in *Asemoplus;* in the broad interspaces between the meso- and metasternal lobes, in the former case always as broad as one of the mesosternal lobes, instead of being slightly (♀) or definitely (♂) narrower, as in *Asemoplus;* in the cerci of the male being quite short, stout and conically styliform, instead of elongate and subfalcate distad as in *Asemoplus;* in the greatly reduced ancorae [5] of the male epiphallus, instead of the broad triangular structures seen in *Asemoplus;* and in the terminal portion of the dorsal valves of the aedeagus of the male bearing a broad trumpet-like expansion of the deplanate frill which largely encircles each valve briefly proximad of its actual, narrowly rounded, bead-like apex, instead of lacking such a frill-like expansion and having the actual apex but little less acuminate than the needle-like apices of the ventral valves, as in *Asemoplus.*

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[5] For use of this term, see Roberts, Proc. Acad. Nat. Sci. Phila., XCIII, p. 241 (1941).

From *Bradynotes* (as exemplified by *B. obesa,* its genotype) *Prumnacris* can at once be distinguished by its less toad-like and more attenuate build, the possession of slip-like tegmina, the much narrower head without strongly tumid genae, in the entirely different type of fastigial development and in the impression of the fastigial disk being completely separated from that of the surface of the frontal costa, by the well developed, instead of greatly reduced, prosternal process, by the virtual absence of that asymmetrical arcuation of the ventral margin of the caudal femora which is so pronounced in *Bradynotes,* and by the different development of a number of features in the internal genitalia of the male, such as the very small and weak ancorae and the above diagnosed development of the dorsal aedeagal valves, instead of the deplanate terminal lateral wings, without a specific apical point, as seen in the valves of *Bradynotes.*

There is some suggestion in *Prumnacris* of *Appalachia* Rehn and Rehn, of the eastern United States, but that genus has numerous features which show its fundamental relationship is with *Dendrotettix,* another eastern genus. It is possible, however, that through *Prumnacris* the *Prumna* line may be more directly tied to the restricted *Podisma* complex, to which *Appalachia* and *Dendrotettix* belong. This consideration can be deferred for future analysis when other aggregates of the whole genera group have been more fully studied.

GENOTYPE:—*Asemoplus rainierensis* Caudell.

Generic features.—General form melanoploid, more fusiform in ♀ than in ♂, not at all (♂) or but slightly (♀) depressed, with abbreviate tegminal slips in both sexes.

Head in cephalic aspect subequal in breadth in ♂, narrowing somewhat dorsad in ♀, breadth across genae hardly at all (♂) or appreciably (♀) greater than that across eyes; genae hardly at all (♂) or but moderately (♀) tumid; fastigium as seen from dorsum trigonal, definitely broader than inter-ocular space, moderately produced, in profile appreciably declivent to the broadly rounded fastigio-facial juncture, dorsal surface shallowly excavate, chiefly caudad, well defined from arcuate surface of occiput and not continuous with any frontal costal sulcation; frontal costa somewhat (♂)

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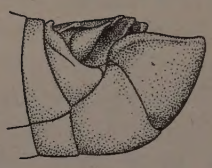
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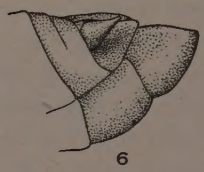
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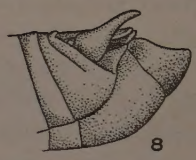
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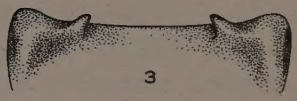
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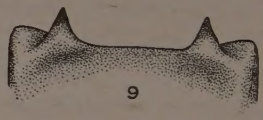
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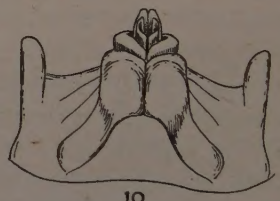
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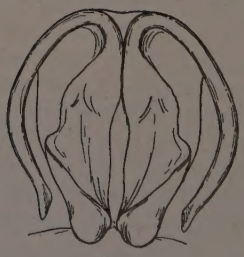
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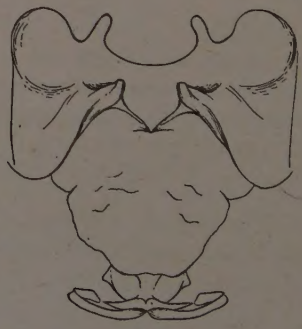
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or markedly (♀) narrower than inter-ocular space, poorly defined on ventral half of face, shallowly sulcate, in ♀ ventrad of median ocellus only; lateral (supplementary) facial carinae evident but not strongly elevated. Eyes not prominent in either sex. Antennae in length somewhat longer than (♂) or subequal to (♀) combined length of head and pronotum.

Pronotum subsellate, in ♂ feebly strangulate as viewed from dorsum, deplanate dorsad and slightly (♂) or distinctly (♀) broadening caudad, in ♀ this involving the whole pronotal length, in ♂ only that portion caudad of second transverse sulcus; lateral margins of disk appreciably but narrowly rounded in section and non-carinate; caudal margin of disk shallowly obtuse-angulate emarginate; transverse sulci well impressed, more prominent in ♂ than in ♀; length of metazonal disk equal to one-third to two-fifths of entire pronotum; median carina definitely indicated only on metazona; lateral lobes of pronotum longer than deep, cephalic and caudal margins obliquely convergent ventrad, surface deeply sculptured by transverse sulci.

Tegmina very brief and narrow lateral slips, usually subspatulate in outline, in length never equalling that of pronotum. Wings absent.

Auditory tympana well developed in both sexes, relatively large, ovate to subreniform in outline.

Prumnacris rainierensis (Caudell). Chinook Pass, Cascade Mts., Washington. Male. Fig. 1.—Dorsal view of apex of abdomen. Fig. 2.—Lateral view of same. Shadow Lake, Yakima Park, Mt. Rainier National Park, Washington. Male. Fig. 3.—Ancorae of epiphallus as seen in dorsal aspect. Fig. 4.—Aedeagus as seen in caudal aspect. Camp of the Clouds, Paradise Valley, Mt. Rainier National Park, Washington. Male (atavistic). Fig. 5.—Dorsal view of apex of abdomen. Fig. 6.—Lateral view of same.

Asemoplus montanus (Bruner). Satus Pass, Washington. Male. Fig. 7.—Dorsal view of apex of abdomen. Fig. 8.—Lateral view of same. Satus Pass, Washington. Male. Fig. 9.—Ancorae of epiphallus as seen in dorsal aspect. Fig. 10.—Aedeagus as seen in caudal aspect.

Prumna primnoa (Fischer de Waldheim). Khingan Station, Manchuria. Male. Fig. 19.—Aedeagus as seen in caudal aspect. Fig. 20.—Epiphallus and ancorae, with aedeagus, as seen in dorsal aspect.

(All much enlarged.)

Prosternal process short, conical, thick proximad, slightly caudad in trend. Interspace between mesosternal lobes transverse in both sexes, subcuneate and narrowing cephalad in ♂, in ♀ of similar general outline but strongly transverse, in breadth equal to that of one of the mesosternal lobes. Metasternal lobes in ♂ but narrowly separated, in ♀ with transverse interspace equal to three-quarters that between mesosternal lobes.

Cephalic and median femora in ♂ stout, moderately inflated.[6] Caudal femora moderately robust in ♂, more attenuate in ♀, their apices reaching to (♀) or appreciably surpassing (♂) the abdominal apex; caudal tibiae relatively stout, external margin with 8–9 [7] spines, no external apical spine, internal margin with 9 spines, internal spurs subequal in length, moderately falcate distad.

Male with furcula usually present as brief subtrigonal or rounded lobes, rarely obsolete; [8] supra-anal plate sublanceolately scutellate, longer than broad, apex rectangulate, surface deeply sculptured; [9] cerci short, stout, conical; subgenital plate hardly broader than long, cup-like, in general shape very bluntly and subobsoletely conical, its dorsal margins as seen from dorsum semi-elliptical, apex but faintly produced; epiphallus (see fig. 3) with ancorae very short trigonal; aedeagus (see fig. 4) with preapical frill of each dorsal valve expanded latero-cephalad into a trumpet-like structure, the apex of these valves, which are mesad, minutely rounded and bead-like, ventral valves of aedeagus acuminate with immediate apices blunted.

Female with supra-anal plate trigonal, apex rounded subangulate, surface shallowly sulcate meso-proximad; cerci short, stout, conical; ovipositor valves short, stout, dorsal surface of dorsal valves moderately excavate, dorso-lateral margins of same valves weakly serrulate proximad, apices of both pairs of valves in profile weakly recurved, lateral plate of ventral valves acute lanceolate distad; subgenital plate with distal margin strongly produced meso-distad, markedly concave ventrad of base of each ventral ovipositor valve.

Distribution.—Cascade Mountains of central and south-central Washington, adjacent Mount Rainier, and the more northern Cascades of Oregon. Normally the genus inhabits the Hudsonian and Arctic Alpine life zones.

Relationship and History.—It is quite evident that *Prumnacris* is a New World member of the same phylum of the Melanopli (Podismini of certain Old World authors) as the eastern Asiatic

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[6] The exception to this, as far as the male is concerned, is seen in the anomalous males with aberrant supra-anal plates discussed on a following page.

[7] This range is purely individual and may be found in the caudal limbs of a single specimen.

[8] In certain aberrant males these are virtually absent, as discussed on a following page.

[9] For the condition of this plate as found in certain aberrant males, see discussion on a subsequent page.

Prumna, but also that the two genera have diverged sufficiently to permit the development in *Prumna* of exceedingly distinctive and unusual features in both the external and internal genitalia of the male. Clearly this phylum is of Old World origin, and its present range in the New World probably dates from a Pleistocene interglacial period, possibly the Puyallup Epoch, which according to Willis [10] and Bretz [11] is the clearly recognizable interglacial between the earlier Admiralty and the later Vashon glaciations of the Puget Sound region. The Puyallup is generally considered to have been relatively warm. If this assumption is correct and the present restricted distribution of the genus is considered, *Prumnacris* then established could have been forced southward by the great Vashon ice-sheet, finding refuge only beyond its margins and in such possibly unglaciated areas as may have existed between it and the alpine ice sheets of the Cascades, Mt. Rainier and the other uplifts which then developed, and in some cases have maintained in diminished extent, their own glacial systems. The overlapping of these sheets and the great semi-continental one filling the present Puget Sound area has been established at some points, but how broadly this took place still seems debatable.

Post-glacial temperatures could readily explain the present isolation of the various populations of *Prumnacris,* which doubtless retreated to those areas of climatic conditions most favored by it, in this case chiefly the glacier and mist shrouded slopes of Mt. Rainier and Mt. Hood, where to-day permanent glaciers descend relatively low. The history of *Prumnacris* apparently was quite different from that of certain related genera we plan to discuss in the near future, and beyond doubt entirely so from that of *Bradynotes.*

Lake Lewis, which according to most geologists covered much of the Columbia plains south of the Okanagan Valley during at least a part of the Pleistocene, may have been another factor in the isolation of *Prumnacris* in the Cascade system. Southward spread in the Cascades over elevated south-central Oregon may have been prevented by the volcanic activity of Mt. Mazama, the great cone

[10] "Drift Phenomena of Puget Sound." Bull. Geol. Soc. Amer., IX, pp. 111 et seq., (1896).

[11] "Glaciation of the Puget Sound Region." Bull. no. 8, Washington Geological Survey. 1913.

of which the present Crater Lake is the blasted-out shell. Vast areas of that portion of Oregon have their surface thickly strewn with pumice from that source, and also numerous lava flows of relative freshness there show the extent to which the southward spread of at least some alpine types may have been inhibited for considerable periods of time.

Prumnacris rainierensis (Caudell)

(Figs. 1–6, pl. I, figs. 11 and 12, pl. II, figs. 15 and 17.)

1907. *Asemoplus rainierensis* Caudell, Proc. Entom. Soc. Wash., VIII, p. 134. [♂, ♀; Mt. Rainier, Washington.]

1912. *Asemoplus rainierensis* Caudell and Hebard, Proc. Acad. Nat. Sci. Phila., 1912, p. 163. [Designation of single type.]

Type.—♂ (in coitu); Paradise Valley, Mount Rainier, Washington; July 31, 1906; (Dyar and Caudell); [United States National Museum].

Our identification of this species has been made from three male and three female paratypes now before us, in addition to some hundreds of topotypes from various levels of Paradise Valley, Mt. Rainier.

Possessing those distinctive characteristics of alpine species, i.e. often great local abundance, relative plasticity in structure and in general bulk, this insect evidences to a very marked degree the influence of a very restricted active life cycle, which forces into a few weeks between the melting of the heavy winter blanket of snow and non-glacial ice and the fall of the first heavy snows of early Autumn, all life stages between the hatching of the egg and final oviposition and death. In Paradise Valley, the type locality, the snow is said quite often to reach a depth of 25 feet, and deep drifts lie in the meadows as late as July, while in some years they have prevented the opening of the park road until August. In addition on many of the summer days relatively low temperatures and great humidity, with heavy fog, occur, with frost the usual thing at night.

In brief this definitely alpine species lives at most of the localities from which it is known, in an atmosphere chilled by adjacent glaciers or perpetual snow. Its survival seems to be due in some measure to its numerical abundance at most points where it has been taken, yet it does not appear sufficiently adaptable to extend

its range beyond a relatively limited alpine area, although related genera of rather similar habits occur with it and also more broadly to the north and east. This may be due to different histories and a lack of similarity in conditions at the respective times these genera were established in the area where both now occur. In a future study we hope to be able to give more consideration to this possibility.

Morphological variation.—The major features of external structural variation to be found in the extensive series now before us are: size, which is here treated separately, the relative width of the interocular space, the exact outline of the fastigium as seen from the dorsum, the relative breadth of the disk of the pronotum, the degree of emphasis of the median carina of the metazona of the pronotal disk, the degree of emargination of the caudal margin of the pronotal disk, emphasis of the furcula, the degree of development, length and shape of the tegmina, and the form of the supra-anal plate in the male sex.

The relative breadth of the interocular space varies in each sex when the larger series are considered, the extremes fully connected by intermediates, and this type of fluctuation is independent of and not correlated with variation in the exact outline of the fastigium, that is the broader interocular space is not necessarily associated with a broader fastigium. The fastigial outline as seen from the dorsum varies appreciably in the degree of the cephalad convergence of the latero-cephalic margins, and this is found indicated in both sexes of the larger series. With this feature is correlated fluctuation in the breadth of the dorsal portion of the frontal costa and, less evidently, the parallel or faintly dorsad convergent character of the lateral margins of the costa. In addition there is appreciable variation in the depth of the excavation of the fastigial disk, and, in profile, in the degree of angulation and prominence of the fastigio-facial angle. Considered collectively the whole fastigial development, including the breadth of the interspace between the eyes, varies very definitely in individuals of both sexes, and to such a degree that we have not simple extremes of a single line of variation, but a criss-crossing of tendencies producing a varied pattern of combined results.

A similar "alpine" plasticity is to be found in the relative caudal breadth of the pronotum to pronotal length, which gives in each sex, but more particularly in the male, a fluctuating ratio, but this must be considered with a less evident yet clearly apparent plasticity in the degree of "strangulation" which may be indicated in the prozona at approximately the second transverse sulcus, and the degree of deplanation of the metazonal section of the pronotal discal surface. Simple measurements of these parts would reflect but little of the varying conditions found, as the three tendencies apparently operate independently and thus, as with the fastigium, produce a multiple pattern, which is duplicated in numerous other alpine forms. The median carina of the metazona is less emphasized in the female than in the male, but shows plasticity of a lesser degree than the proportions element in both sexes. The emargination of the caudal margin of the pronotal disk is definitely variable in its degree of emphasis and also in the extent to which the marginal arms of the angle may be straight convergent or gently convex mesad.

The furcula of the male range from being virtually unindicated to distinct but low rounded-trigonal paired lobes. The virtually unindicated condition is generally, but not invariably, found in those anomalous males with aberrant supra-anal plates which are discussed on a subsequent page, and probably this reduction may there be a reflection of the same controlling influence, whatever this may prove to be.

The length of the tegmina in an invariably brachyterous species is generally subject to appreciable variation, perhaps because it is potentially a vanishing structure—certainly one no longer of value in the economy of the insect. Variation in the exact shape of the tegmen, and the ratio of its greatest breadth to length, is marked and purely individual in *rainierensis,* not at all connected with specific localities. While in many specimens the tegmina are subequal in width and no broader distad than proximad or mesad, in others they are definitely spatulate. The following measurements of exposed tegminal length, taken with a calibrated grating, give the extremes found in both sexes of the larger series:

♂. Lower Paradise Valley, Mt. Rainier, Washington (81 males), 1.46–3.26 mm. Camp of the Clouds, Mt. Rainier, Wash-

ington (145 males), 1.63–3.74 mm. Chinook Pass, Cascade Mts., Washington (38 males), 2.11–3.42 mm. Mt. Hood, Oregon (7 males), 2.11–4.23 mm.

♀. Lower Paradise Valley, Mt. Rainier, Washington (107 females), 1.79[12]–3.09 mm. Camp of the Clouds, Mt. Rainier, Washington (122 females), 1.63–4.07 mm. Chinook Pass, Cascade Mts., Washington (22 females), 2.44–3.26 mm. Mt. Hood, Oregon (39 females), 2.93–4.72 mm.

Often a difference in length in the tegmina of the same individual is seen, and occasionally one has been lost, apparently by violence. Rarely (one male from Narada Falls) one tegmen may be of the longest type, the other of the shortest. Teneral specimens show a degree of variation in tegminal proportions equal to that indicated in those which have fully hardened, and thus teneral condition is not at all correlated with the shortest tegmina. Similarly there is no evident correlation of shorter tegmina in the males with the anomalous type of supra-anal plate discussed below.

The tegmina always show the lack of directness and the irregularity of venation noticed in many brachypterous alpine locusts, particularly of the Melanopli, and especially in those genera of the several Holarctic complexes of the group. The deterioration produced by disuse and loss of function is well illustrated in the tegminal development of *Prumnacris*.

The anomalous condition found in certain males of this species has caused considerable speculation, and its explanation must await future investigation with fresh or wet preserved material. With the exceptions noted on a following page all the adult males before us agree in the scutellate form and deeply sculptured dorsal surface of the supra-anal plate. They also have essentially the same degree of inflation of the cephalic and median femora, of the stoutness and general form of the caudal femora and an intimation of tumidity and well impressed transverse sulci to the pronotum. Clearly immature males, which show by their size, character of the reversed rudimentary tegminal slips and the evident immaturity of numerous external features their true status, fully agree with the normal adult males in shape and sculpture of the supra-anal plate. However, the males listed beyond agree with one another in pos-

[12] The mate of this tegmen is somewhat larger.

sessing supra-anal plates which are definitely trigonal in outline, proportionately broader proximad than those of normal males, and with their surfaces as a whole but shallowly sculptured, the most evident feature being a shallow medio-longitudinal sulcus on the proximal half. These specimens accordingly completely or virtually lack the paired, deeply carved longitudinal sulci seen in normal males, and also have but little indication of the sharply delimited lamellation of the proximo-lateral borders of the plate found in the norm of the sex. In other words the supra-anal plate seen in these specimens is a virtual replica of that found in females of the species.

With this anomalous supra-anal plate there is correlated, in these males, a rather smaller size, lighter build, less bullate and more shallowly sulcate pronotum, little inflated or virtually uninflated cephalic and median femora, and more slender and attenuate caudal ones, these femoral conditions definitely suggesting feminine tendencies.

In these aberrant males the tegmina average as well developed as in the norm of the species, and their condition indicates these specimens are fully mature. There is no indication externally of either hermaphroditic or gynandromorphic character, yet very clearly these males have in some way been diverted from the normal course of development of the sex. What this influence may have been remains to be determined, although it has been suggested by our friend Dr. A. Glenn Richards, Jr., of the University of Pennsylvania, that parasitic castration may be the explanation.

These aberrant males are present only in series taken where the species was found in great abundance, and are all from localities distributed along a few miles of continuous alpine meadows. The points represented and the number of aberrant males from each, contrasted with the total representation of that sex from the locality, are as follows:

Narada Falls, Mt. Rainier, Washington, 2 out of 25.

Lower Paradise Valley, above Narada Falls, Mt. Rainier, Washington, 16 out of 81.

Camp of the Clouds, Mt. Rainier, Washington, 7 out of 145.

These figures show a ratio ranging from as low as 4 to as much as 20 per cent.

All of these specimens were taken on two consecutive days (August 23 and 24, 1910). No intimation of this condition is evident in the series from Chinook Pass in the Cascades, Washington, or that from Mt. Hood, Oregon, nor in several smaller lots from other points listed beyond.

A very few of the males here listed as anomalous show their distinctive features less decided than in the others, the lamellate proximo-lateral margins of the supra-anal plate being more evident, the proximal breadth of the same less decided and the paired sulci of the normal male plate weakly indicated, while the cephalic and median femora may be weakly bullate, but in all cases the overall structure of the supra-anal plate is clearly distinct from the normal type. It is evident that, whatever may be the controlling factor, there is some fluctuation in its emphasis.

While female individuals of *rainierensis* vary very markedly in size, and somewhat in bulk and the emphasis of certain sculpture, there is nothing evident in external features equivalent to what we find in the males above discussed.

Size variation.—The following measurements (in millimeters) give the size extremes found in the larger series examined, and also several single individuals from key localities.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂, Lower Paradise Valley, Mt. Rainier, Washington	14.5	3.2	1.46	8.1
♂, Lower Paradise Valley, Mt. Rainier, Washington	16.7	3.9	2.77	9.1
♂, Camp of the Clouds, Mt. Rainier, Washington	15.9	3.2	2.44	8.8
♂, Camp of the Clouds, Mt. Rainier, Washington	19.8	3.9	3.74	9.1
♂, Chinook Pass, Cascade Mts., Washington	14.3	3.7	2.44	8.9
♂, Chinook Pass, Cascade Mts., Washington	16.1	3.7	3.26	9.7
♂, Mt. Hood, Oregon (6000–7000 feet)	15.8	3.5	2.77	10.9
♂, Mt. Hood, Oregon (3290 feet)	17.4	4.2	3.26	10.6
♂, Windy Point, Cascade Mts., Oregon	19	4.4	3.09	10.1
♀, Fish Lake, Washington	24.1	4.8	4.23	—[13]

[13] Caudal limbs missing.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♀, Lower Paradise Valley, Mt. Rainier, Washington	19.1	4	2.77	9.7
♀, Lower Paradise Valley, Mt. Rainier, Washington	23.6	4.7	3.42	11.4
♀, Camp of the Clouds, Mt. Rainier, Washington	18.2	3.4	2.44	11.5
♀, Camp of the Clouds, Mt. Rainier, Washington	26 [14]	4	3.42	11.7
♀, Chinook Pass, Cascade Mts., Washington	19.7	4.5	2.44	11
♀, Chinook Pass, Cascade Mts., Washington	22.8	5	3.26	11.4
♀, Mt. Hood, Oregon (6000–7000 feet)	23.1	4.2	3.42	11
♀, Mt. Hood, Oregon (6000–7000 feet)	28	4.5	4.40	12.7

These figures indicate a slightly larger average size in those specimens from the Oregon section of the Cascades, and also a somewhat greater bulk in the few individuals which have been seen from localities at the lowest elevations from which the species is known. Whether the latter tendency would be supported if more extensive representations from these particular levels were available, remains to be determined.

Color variation.—There is a very appreciable amount of individual color variation in the series of *P. rainierensis,* and this can be grouped as in base tones or in pattern element emphasis. There is greater richness in the aniline yellow of the ventral portion of the lateral lobes of the pronotum and on the ventral half of the lateral aspect of the abdomen in certain individuals than in others, but all adults seen have the dark postocular bars well indicated on the dorsal portion of the lateral lobes, although varying appreciably in breadth, depth of tone and solidity. Rarely the dorsal aspect of the head, nota and abdomen is more orange-citrine than in others, on the abdomen, in these cases, usually well contrasted laterad with shining fuscous-black longitudinal bars dorsad on the lateral aspects of the abdomen. In the opposite extreme, between which are all imaginable intergrades, the entire dorsum is brownish olive.

The usual general tone value is warm brown, rather near mars brown (of Ridgway), occasionally more nearly approaching russet, and again more similar to dull olivaceous. In rare individuals

[14] Abdomen somewhat overextended.

with melanic tendencies much of the dorsum of the pronotum is solidly fuscous, except for pale and contrasted pencillings of the lateral angles of the disk. The depth of tone and extent of the carmine suffusion of the caudal femora in the males also varies individually, although it is usually quite evident on the ventral half of the femora.

As a whole the Chinook Pass series is more rufescent in overtone, approximating burnt sienna to bay, than those from Mt. Rainier localities, which average duller and more brownish. The Mt. Hood individuals of both sexes are in general tone very distinctly more citrine than any others, ranging in overtone from as dark as dark greenish olive (of Ridgway) to as light as yellowish citrine. The single Windy Point male is quite brownish in general tone, with no greenish or olive tendency.

Distribution.—The area inhabited by this species includes parts of the Arctic Alpine, Hudsonian and Canadian Life Zones in the Cascade Mountains and neighboring peaks, from at least as far northward as the vicinity of Fish Lake on the eastern slope of the Cascades in Chelan County, Washington, south definitely as far as Windy Point, on the eastern slope of the Cascades in Deschutes County, Oregon. Its occurrence in the Canadian Life Zone is infrequent and probably due to marginal infiltration in exceptionally favorable conditions. It doubtless occurs at a great many points within its limited known range, and perhaps at other localities to the northward in Washington, and possibly, but not probably, to the south of Windy Point.

Its vertical range, on the basis of known elevations, extends from as low as 3290 feet on the Mt. Hood road to Cloud Cap Inn, to as high as 7200 feet on ridges surrounding upper Paradise Valley on Mt. Rainier, Washington. These extremes represent determined elevations at localities where the species was definitely taken by Mr. Hebard and the senior author.

Zonally the species is Arctic Alpine and Hudsonian by preference, and has been taken definitely in the Canadian only at a few places such as Windy Point and at 3290 feet on the Cloud Cap Inn road on Mt. Hood. In both of these cases it was found in open places in heavy forest of spruce or firs or both, and was quite uncommon or but a single specimen was noted. The Fish Lake

specimen very probably did not come from the immediate vicinity of that body of water, which is quite near Wenatchee Lake and at an elevation of about 1900 feet. This individual most certainly was secured on one of the several surrounding peaks, which within a distance of a few miles reach to from 5300 to over 6000 feet elevation, and on which the Hudsonian conditions preferred by *rainierensis* undoubtedly occur.

Bionomics.—A lover of alpine meadows with the chill dampness of nearby glaciers and permanent snow-fields, *Prumnacris rainierensis* is found at its best in the lush carpets of annuals and grasses which in the brief span of August make these usually inhospitable spots a fairyland of color and rich, if lowly, plant life.

Here, it can be found in these often moraine-bordered basins, where the last outposts of the Hudsonian subalpine fir (*Abies lasiocarpa*) creep up the nearby ridges reaching toward the glaciers, until they find the struggle too great and timber ceases.

On Mt. Rainier it was found abundant as low as 4000 feet (Narada Falls) in heavily grassed meadow, and less numerous along the nearby forest margin; at 5400 to 5600 feet in Paradise Valley and Paradise Park it was very common in meadows, at 5600 to 6200 feet common, and above this to as high as 7200 feet, on the steeper slopes just below perpetual snow and overlooking Nisqually Glacier, a thousand feet below, it was much scarcer. In much of Paradise Valley it virtually swarmed in the carpet of bright colored annuals, heather and blueberries, while at the extreme elevation it was in and about patches of the prostrate *Juniperus sibiricus*. In the Yakima Park area on the northeastern flank of Mt. Rainier, and overlooking the foot of the great Emmons Glacier, *rainierensis* was found very local on slopes and flats among subalpine firs and white-barked pines (*Pinus albicaulis*), in very low shrubs with a carpet of flowering annuals of varied colors growing in a soil composed largely of pumice fragments. At Chinook Pass on the main Cascade chain, about twelve miles due east of the summit of Mt. Rainier, the species was abundant in virtual timber-line conditions, with subalpine firs ascending somewhat higher (about three hundred feet) on surrounding peaks. Here it occurred in low cover of lush grass, ericaceous shrubs and flowering annuals, and also in other situations where the ground cover was a dwarf conifer but a few inches high. Males were then

(August 1) much more numerous and more active than the females.

On Mt. Hood, Oregon but a few individuals were taken at 3290 feet in an open place in heavy spruce and fir forest—apparently a peripheral occurrence—while from Cloud Cape Inn to the lateral moraine of nearby Eliot Glacier at 7000 feet it was found regularly, but not common, in wet spots carpeted with alpine flowers, in lush tall grasses or in low dry grass on ashy ground at the very morainal border. The conditions on Mt. Hood from 6000 to 7000 feet are very definitely Arctic Alpine, with Hudsonian subalpine fir (*Abies lasiocarpa*) and alpine hemlock (*Tsuga mertensiana*) on some of the low morainal ridges virtually extending to the perpetual snow. At Windy Point, below lava blanketed McKenzie Pass, the single specimen of *rainierensis* taken was the only orthopteron seen in an area of undergrowth in spruce forest. This locality is virtually Hudsonian—a shelf on an exposed point, with white-barked pine (*Pinus albicaulis*) present at but little more than a hundred feet higher (i.e. 5000 feet elevation), and above this stretches vast lava fields to and through McKenzie Pass.

The earliest date represented by the material before me is July 30 (Fish Lake), the latest September 17 (Mt. Rainier), with the bulk of the material secured in August. From our experience we feel the extreme dates just cited cover nearly the entire period in which living adults will be found. After mid-September at most of the preferred habitats alpine autumnal conditions soon dispose of any surviving adults.

Specimens examined: 708; 315 ♂, 336 ♀, 22 immature ♂, 35 immature ♀.

WASHINGTON: Fish Lake [Chelan County]; VII, 30, 1900; (A. D. Dunn); 1 ♀; [Hebard Cln.]. Mount Rainier, Mount Rainier National Park; (A. N. Caudell); 1 ♂ (*paratype*); [Hebard Cln.]: (Caudell and Dyar); several labelled VIII; 2 ♂, 3 ♀ (*paratypes*); [A.N.S.P. and Hebard Cln.]: VIII, 25, 1928; 1 ♂, 1 ♀ (in coitu); [Hebard Cln.]: IX, 17, 1929; (Paul Eide); 1 ♀; [Hebard Cln.]: IX, 6, 1929; (E. E. Carothers); 10 ♂; [A.N.S.P.]. Narada Falls, Mt. Rainier, Mt. Rainier National Park, 4000–4200 feet elev.; VIII, 23, 1910; (R. & H.); 5 ♂, 38 ♀, 5 immat. ♂, 14 immat. ♀; [Hebard Cln. and A.N.S.P.]. Lower Paradise Valley above Narada Falls, Mt. Rainier, Mt. Rainier National Park, 4500 feet elev.; VIII, 23–24, 1910; (R. & H.); 81 ♂, 107 ♀, 10 immat. ♂, 9 immat. ♀; [Hebard Cln. and A.N.S.P.]. Camp of the Clouds, Paradise Valley, Mt. Rainier, Mt. Rainier National Park, 5400–7200 feet elev.; VIII, 23–24, 1910; (R. & H.); 145 ♂, 122 ♀, 7 immat. ♂, 10

immat. ♀; [Hebard Cln. and A.N.S.P.]. Shadow Lake, Yakima Park, Mt. Rainier National Park, 6300–6400 feet elev.; VIII, 2, 1941; (Rehn and Rehn); 4♂, 2♀; [A.N.S.P.]. Chinook Pass, Cascade Mountains, east entance to Mt. Rainier National Park, 5440 feet elev.; VIII, 1, 1941; (Rehn and Rehn); 38♂, 22♀, 2 immat. ♀; [A.N.S.P.].

OREGON: Cloud Cap Trail, Mount Hood, 3290 feet elev.; VIII, 20, 1910; (R. & H.); 1♂, 5♀; [Hebard Cln. and A.N.S.P.]. Cloud Cap Inn, Mt. Hood, 5837 feet elev.; VIII, 18, 1910; (R. & H.); 1♂, 1♀; [Hebard Cln.]. Cloud Cap Trail, Mt. Hood, 6000–7000 feet elev.; VIII, 18–20, 1910; (R. & H.); 5♂, 28♀; [Hebard Cln. and A.N.S.P.]. Mt. Hood, 6000 feet elev.; VIII, 18, 1916; (G. P. Engelhardt); 5♀; [Hebard Cln.]. Windy Point, 4 miles N.E. of McKenzie Pass, Cascade Mts., Deschutes County, 4860 feet elev.; VIII, 24, 1928; (R. & H.); 1♂; [Hebard Cln.].

SUPPLEMENTARY NOTE TO PART I

FRUHSTORFERIOLA Willemse

1922. *Fruhstorferiola* Willemse, Entom. Mitteil., XI, p. 3. Genotype.—*F. tonkinensis* Willemse.

1939. *Caudellacris* Rehn and Rehn, Trans. Amer. Entom. Soc., LXV, pp. 67, 69. Genotype.—*C. omei* Rehn and Rehn.

Ramme[15] has pointed out that our *Caudellacris,* known to us from two species from China and one from the Loo Choo Islands, is not separable from Willemse's earlier *Fruhstorferiola,* based on a single female individual from Tonkin. Unfortunately Willemse knew only the female sex of his genus, which he referred to the neighborhood of *Catantops* and compared with the entirely unrelated *Moessonia* Willemse from Celebes. No intimation of the true relationship—even the containing section of the subfamily—was given by him. The single figure supplies only a dorsal view of the head and pronotum, and is without sufficient detail of these parts to be of any real assistance.

It is difficult to determine from Willemse's description of his *tonkinensis,* described from Than-Moi, Tonkin, on the basis of the above-mentioned single female now in the Vienna Museum, the exact relationship of his species to *F. viridifemorata* (Caudell), from Fukien and Chekiang Provinces, China, and to *F. omei* (Rehn and Rehn), from Szechuan Province, China. The one feature mentioned in his description which might be of assistance in placing the species is the shape of the margin of the female sub-

[15] Mitt. Zoolog. Mus. Berlin, XXIV, p. 150, (1939).

genital plate. However, while this is described, there is a lack of sufficient definiteness in his wording to prove closer affinity to *viridifemora* or to *omei,* although the shape of this margin is characteristic in each of these species, and has been figured by us for both.[16] In consequence a clearer idea of the exact relationship of *Fruhstorferiola tonkinensis* Willemse to *F. viridifemorata* (Caudell), *F. okinawaensis* (Shiraki) and *F. omei* (Rehn and Rehn) must await the acquisition of Tonkin material of the genotypic species. Our understanding of the relationship of the generic entity, however, remains as presented in our previous paper.

Explanation of Figures

Plate I

Fig. 11.—*Prumnacris rainierensis* (Caudell). Male. Chinook Pass, Cascade Mts., Washington. Dorsal view. (× 3.)

Fig. 12.—*Prumnacris rainierensis* (Caudell). Female. Chinook Pass, Cascade Mts., Washington. Dorsal view. (× 3.)

Fig. 13.—*Asemoplus montanus* (Bruner). Male (*type*). Colville Valley, Washington. Dorsal view. (× 3.)

Fig. 14.—*Asemoplus montanus* (Bruner). Female. Park Rapids, Stevens Co., Washington. Dorsal view. (× 3.)

Plate II

Fig. 15.—*Prumnacris rainierensis* (Caudell). Male. Chinook Pass, Cascade Mts., Washington. Lateral view. (× 3.)

Fig. 16.—*Asemoplus montanus* (Bruner). Male (*type*). Colville Valley, Washington. Lateral view. (× 3.)

Fig. 17.—*Prumnacris rainierensis* (Caudell). Female. Chinook Pass, Cascade Mts., Washington. Lateral view. (× 3.)

Fig. 18.—*Asemoplus montanus* (Bruner). Female. Park Rapids, Stevens Co., Washington. Lateral view. (× 3.)

[16] Trans. Amer. Entom. Soc., LXV, p. 71, text-figs. 2 and 3, (1939).

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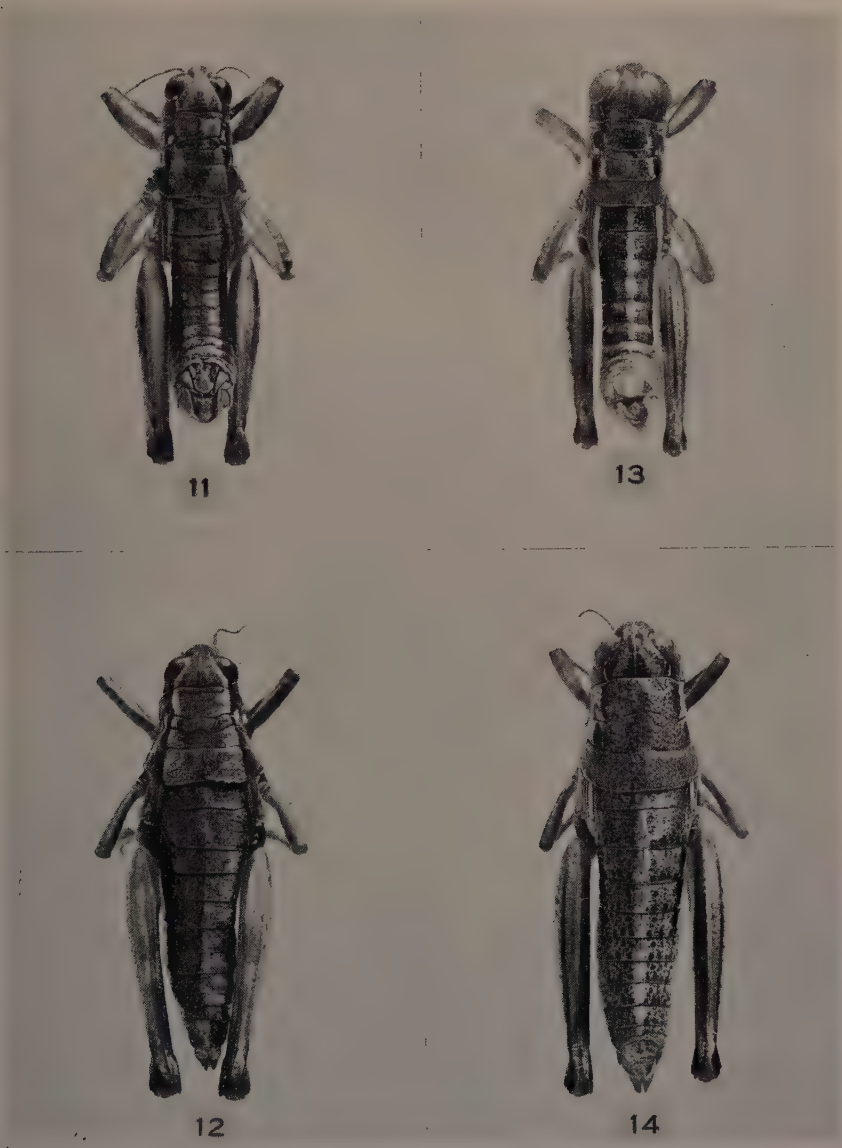

REHN AND REHN—CYRTACANTHACRIDOID GENERA

REHN AND REHN—CYRTACANTHACRIDOID GENERA

A PRELIMINARY REVISION OF THE POMPILINAE (EXCLUSIVE OF THE TRIBE POMPILINI) OF THE AMERICAS

(HYMENOPTERA: POMPILIDAE)[1]

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(Plates III and IV)

I am indebted to the authorities of four museums for the loan of material that has made this review possible: The Academy of Natural Sciences of Philadelphia [Acad. Nat. Sci. Phila.],[2] the United States National Museum [U. S. Nat. Mus.], Museum of Comparative Zoology at Harvard University [Mus. Comp. Zool.], and the Carnegie Museum at Pittsburgh [Carnegie Mus.]. From the latter Mr. Sneadner courteously sent me for study types of Fox's Brazilian species, Dr. Henry K. Townes sent me the rich material of the National Museum, and I have been permitted to freely consult and borrow from the collections of the other two institutions and examine types on several occasions during the preparation of this paper. I particularly appreciate the many helpful suggestions received from Mr. Nathan Banks, both by word of mouth and by letter, and Mr. E. T. Cresson has taken his valuable time to respond by letter to queries on particular points that had escaped my attention while at the Academy.

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[1] By action of the International Congress of Zoological Nomenclature (Bulletin of Zoological Nomenclature, 1943, v. 1, part 3, p. 59–60), the rules of zoological nomenclature as they apply to *Psammochares* and *Pompilus* were suspended, *Pompilus* was validated and *Pompilus pulchra* Fabr. designated its type. As recorded on pages 76–77 of the same bulletin, objections to this action subsequently received were considered by the International Commission on Zoological Nomenclature, but were disallowed and the Commission on page 77 announces its intention to publish an Opinion covering the case. This has not been done as yet.

It, therefore, is necessary to restore the old names *Pompilus* and Pompilidae.

[2] In compliance with the requirements for publication by the American Entomological Society, certain material has been placed in the collection at the Academy of Natural Sciences of Philadelphia, by the author.

Morphology and Terminology

Head.—The orthognathous head is short (in the longitudinal axis of the body), capping the alitrunk like a lens, and in many instances concave behind, so that it fits snugly to the thorax; in dorsal view the vertex is strongly transverse, usually more or less sharply margined, and the occipital surface in the females with collars raised medially (Ctenoceratini and Aporini) may be exceedingly short. The front in the Allocharini is strongly gibbous, but in the Aporini, Pedinaspini (Plate IV, fig. 26) and Ctenoceratini shows an increasing tendency toward flatness, and is elongate, by reason of the fact that the antennae are placed low on the face; the latter character reaches an extreme in *Planiceps* and related forms in which the antennal sockets are partly or wholly below the lower margin of the eyes, so crowding the clypeus that it is reduced to a short strongly transverse crescent. The front is interrupted below on each side by the antennal fossae which usually extend obliquely from the antennal sockets toward the eyes, but in *Euplaniceps* and related genera extend vertically upwards halfway to the front ocellus. The lower median part of the front, a somewhat indefinite triangular area enclosed laterally by the small frontal laminae, following Betrem,[3] I designate the *spatium frontale,* and the very small median area between the base of the clypeus and the antennal sockets the *area frontalis;* the antennal fossae are usually confluent medially in Aporini, but in Ctenoceratini they are divided by a median carina, which frequently assumes the proportions of a flat-topped bridge connecting the highly flattened front and clypeus in one and the same plane. This condition also occurs in some species of *Euplaniceps.* In other Aporini, on the contrary, as in many other Pompilidae, the spatium frontale between the antennal sockets is perpendicular to the plane of the clypeus or of the front. The elevated flattened clypeus, projecting forward over the mandibles as a strong free plate, is characteristic of many Ctenoceratini and some *Pedinaspis* and may, as has been suggested, serve to open the doors of trapdoor spiders. The mandibles have one or two teeth on the inner margin, and in some

[3] Monographie der Indo-australischen Scoliiden mit zoogeographischen Betrachtung. (Treubia, Buitenzorg, IX. Suppl., 388 pp., 5 pls., map, figs., 1928.)

Aporini an erect tooth, subtended by a notch, on the inferior margin; the latter may be margined by a lamella, set off by a fimbriate groove, and such grooves, or isolated bristles, may occur elsewhere. Insufficient attention has been paid to these characters, which may at times be helpful in indicating tribal relationships. In comparison with most Pompilini the antennae of the tribes here discussed are short and the segments thick; this is especially noticeable in the males. The scape may be barrel-shaped, but in Ctenoceratini and Pedinaspini is flattened and curved.

Alitrunk.—The dorsal surface of the pronotum, especially in the females, is well developed, often longer than wide, and in comparison with most Pompilini very flat. This in fact has been one of the chief characters relied upon for recognition of most of these genera. Anteriorly there may be a distinct perpendicular surface, preceded by the (in profile) horizontal collar, but in females of Ctenoceratini and Aporini the collar is elevated medially, so that in profile the outline of the pronotum is scarcely interrupted in extending to the occiput, and may even be raised (*Dromopompilus*). The sides of the dorsal surface of the pronotum may be margined by more or less distinct ridges. I have applied the term *streptaulus* to a groove which normally crosses the collar posteriorly, divides the humeri into an upper and a lower lobe, and continues horizontally or obliquely across more or less of the side-pieces of the pronotum; rarely it turns obliquely upwards, passing in front of the spiracular tubercle, but this portion is usually represented by a disconnected furrow or pit. The metapostnotum is usually short, sunken and often concealed, but sometimes strap-shaped, and with the sides nearly vertical. The posterior margin of the mesosternum may be produced to form a short, often acute lamina at the base of each coxa, with a notch between, the shape of which characterizes certain species. The postero-lateral margins of the propodeum are dentiform in Allocharini, but in the tribes covered in this paper the propodeum usually is smooth and with even contours. Only in some sections of *Psorthaspis* do we find corrugations, and certain irregularities of the surface.

Legs.—In the females of Epipompilini and nearly all Aporini the front femora are inflated in varying degree. The spiny armature of the posterior margin of the under surface of the front tibiae,

of their apex, and of the posterior side of the metatarsi is characteristic of different species, but there is nearly always present a median row of spines under the basal tarsal segments, of which no account is taken in the descriptions; there is also a median flattened scale at the apex of each segment of the front tarsus except the last, which in some instances forms a perfect suction cup. The front claws of the males (Plate IV, fig. 28) are usually, but not always, asymmetric, and in this case it is the anterior claw of each pair that is smaller, its outer ray abnormally curved, sometimes long and twisted, and with a wider than normal interval between it and the basal lobe, which is usually rounded and broader than normal. Other claws in each sex may be toothed, or by exception bifid, the inner ray sometimes truncate (Plate IV, fig. 30). In Allocharini (Plate IV, fig. 29) the claws are of an unique shape. The females never have a true tarsal comb, *i.e.* with a long spine at the middle of the side of the 2nd tarsal segment, but in *Plectraporus* there is a peculiar type of comb composed of short, broad, and flattened spurs, presumably fossorial. The segments of the front tarsi of the females, in comparison with most Pompilini, are usually short and thick in varying degree. The ultimate segment of all tarsi may be devoid of spines underneath (except the apical pair) or have a few pairs of spines, but never a median row, as in Pompilini. Spinules in pits are usually present on the upper surface of the hind femora before the apex, especially in the males, but not in all Ctenoceratini; and the spines at the apices of the hind tibiae are usually of diverse length and tend to be "splayed out." Allocharini are almost devoid of spines, and the body of hair.

Wings.—In Aporini there are only two submarginal cells, and the position of the 2nd recurrent vein is constant and of importance in differentiating between genera. The other venational characters do not seem to have great taxonomic importance in these tribes.

Abdomen.—The apical margin of the seventh (apparent sixth) sternite of the male is always deeply emarginate, and, as in most Pompilidae, bears a pair of chitinized hooks on or near the sides of the emargination. The eighth sternite is concealed, or its tip ex-

posed at the base of the ninth, which it underlies; it is a small, nearly membranous crescent except in Allocharini (Plate IV, fig. 7) in which it is wish-bone-shaped and chitinized. The shape of the ninth (ultimate) sternite of the male is of great taxonomic importance (Plate III, figs. 1–21, and Plate IV, figs. 1–9).

I have employed the terminology advanced by Snodgrass [3a] for the male genitalia. These are of primary importance in the taxonomy of genera and species.

Colors.—The names of colors placed in parentheses refer to the tints illustrated in Robert Ridgway's Color standards and color nomenclature.

Measurements

To avoid repetition, I have expressed certain relative measurements of species in the following terms. These are scale measurements on an ocular micrometer, taken under one of two magnifications.

Head measurements.—a = posterior margin of vertex to anterior border of clypeus; b = greatest width, including eyes; c = distance of eyes apart at vertex; d = least distance between eyes at bottom; e = greatest distance between inner eye-margins; f = distance from clypeal suture to front ocellus; g = distance above clypeal suture at which antennal fossae become obsolete; h = length of clypeus; i = breadth of clypeus.

Ocellar measurements.—a = hind ocelli to hind margin (the head being turned until the margin becomes a fairly sharp outline); b = diameter of hind ocelli; c = distance of hind ocelli apart; d = least distance of hind ocelli from lateral eyes.

Antennal measurements.—These give the relative length of the first four segments.

Dorsal measurements.—a = length of pronotum on median line, including collar; b = greatest width of pronotum; c = length of mesonotum.

[3a] Snodgrass, Robert Evans. The male genitalia of Hymenoptera. (Smiths. Miscell. Coll., xcix, 103 pp., 1 pl., 1941.)

Key to Tribes of Pompilinae [Psammocharinae] known to occur in America

Females

1 a. Three submarginal cells.....2

b. Only two submarginal cells. (If the profile of the propodeum is dentiform, cf. *Aporinellus* in Pompilini); mandibles and dorsal surface of pronotum as in 2 b or the inferior margin with a tooth; front femora usually incrassate; antennae inserted low and ocelli high.....APORINI

2 a. Collar sunk far below the level of the dorsum and vertex; frontal fissure entirely wanting, or dividing the spatium frontale into two lobes, or replaced on spatium frontale by a tubercle, but never present only on middle of front.....3

b. Median portion of dorsal surface of pronotum continuous on an uninterrupted plane to behind the occiput, or very slightly depressed at the collar, the whole in profile not quite flat but nearly so, the collar well-marked, not linear, its anterior margin projecting forward against the occiput almost at the summit of the hind part of the head, the streptaulus well marked on each side, where it is a normal distance behind the anterior margin, but obsolete in the middle; apical portion of lower margin of mandibles with a long narrow lamina which is set off by a fimbriate groove and the inner margin with a single tooth; ultimate segment of tarsi with only apical spines underneath, or with pairs of spines, never a single row; no tarsal comb; frontal fissure present as a fine impressed line on lower median part of front, but terminating above the level of the upper margins of the antennal sockets; face divided medially by at least a fine carina, which usually assumes the proportions of an elevated and often flat-topped ridge CTENOCERATINI

3 a. A distinct collar and streptaulus present; mandibles never of type indicated under 3 b; front femora never incrassate and segments of front tarsi usually not shortened; penultimate segment of labial palpi not broadly ovate.....4

b. No distinct collar; no streptaulus, even at humeri; mandibles with entire outer surface coarsely hairy, but without fimbriate grooves or long bristles and no lamina on inferior margin; front femora moderately incrassate, and segments of front tarsi shortened; penultimate segment of labial palpi very broadly ovate, the succeeding segment attached at one side, so that it is almost securiform; no tarsal comb; ultimate segment of tarsi with only apical spines underneath EPIPOMPILINI

4 a. Neither tarsal comb present nor a median row of spines underneath ultimate segment of tarsi.....5

b. A tarsal comb present, or a median row of spines underneath ultimate segment of tarsi, or both.....POMPILINI

5 a. Postero-lateral margins of propodeum not dentiform; claws toothed beneath or bifid; front not gibbous; legs spinose.....6
b. Posterior face of propodeum deeply concave, its lateral margins prominent, dentiform; claws with a broad basal lamina and a slender, slightly curved apical ray (Plate IV, fig. 29); all legs devoid of spines except for apical spinules on tarsal segments; collar present, very short; streptaulus complete; front in profile almost gibbous above bases of antennae.....ALLOCHARINI
6 a. Anterior face of pronotum sloping and rounding into the dorsal, not smooth and glabrous; posterior surface of head convex and not smooth and glabrous, the vertex not sharply margined; scape straight, barrel-shaped 7
b. Anterior face of pronotum vertically truncate, smooth and glabrous, perpendicular to both dorsal surface and collar; posterior surface of head a little concave, smooth and glabrous, forming a sharp margin with vertex; scape somewhat flattened and curved. (Palearctic) PEDINASPINI
7 a. Apical margin of clypeus deeply concave, the labrum fully exposed; mandibles slender, with one inner tooth, the inferior margin simple, without lamella or fimbriate groove; upper surface of front tibiae spinose; front coxae elongate and with a large apical lamina; claws cleft .....ALLOCYPHONYCHINI
b. Margin of clypeus not concave, the labrum concealed; mandibles with two inner teeth or without a lamella and fimbriate groove on apical part of inferior margin; upper surface of front tibiae not spinose; front coxae not elongate and without a large apical lamina; claws toothed.....*Chalcochares* and *Gymnochares* in POMPILINI

Males

1 a. Three submarginal cells.....2
b. Only two submarginal cells. (If the profile of the propodeum is dentiform, cf. *Aporinellus* in POMPILINI).....APORINI
2 a. Flagellum not serrate, and at most only the apical segments a little crenulate; labrum not exposed; malar space wanting or shorter than distance between front and hind ocelli.....3
b. Flagellum crenulate and in profile serrate with a blunt tooth-like lobe at base of each segment; labrum fully exposed; malar space longer than distance between front and hind ocelli; front claws asymmetrical, other claws cleft.....ALLOCYPHONYCHINI
3 a. Profile of propodeum not dentiform; hind and middle claws dentate or cleft 4
b. Profile of propodeum dentate behind; hind and middle claws with a broad basal lobe (Plate IV, fig. 29), and a slender curved apical ray ALLOCHARINI

4 a. Antennae short and thick, scarcely reaching scutellum, the third segment less than twice as long as broad.....5

b. Antennae slender and longer, segment 3 twice as long as wide or usually much more.....POMPILINI

5 a. Volsellae flat and falciform (Plate IV, fig. 32); parameres as long as parapenial lobes or longer; these either strongly flattened horizontally, curved and lying over aedeagus, or slightly flattened and clavate; aedeagus spatulate.....6

b. Volsellae (Plate III, fig. 22) strap-like, twisted, and sometimes with a widened head; parameres much shorter than parapenial lobes; these lying closely parallel, straight, compressed dorsoventrally, and in profile seen to have an apical vertical lamina; aedeagus slender and rod-like (American genera).....CTENOCERATINI

6 a. Parapenial lobes but little flattened, straight slender and clavate; aedeagus but moderately widened apically (Plate IV, fig. 32). Palearctic PEDINASPINI

b. Parapenial lobes strongly flattened, slender, curved, overlying the very wide aedeagus.....*Nannopompilus* & *Sophropompilus* in POMPILINI

TRIBE CTENOCERATINI

1929. Claveliinae Haupt, Mitt. Zool. Mus. Berlin, XV, p. 111.
1934. Ctenocerinae Arnold, Ann. Transvaal Mus., XV, p. 386.

♀. Hind margin of head more or less sharp, the posterior surface very short medially and the occipital carina very close to the margin by reason of the upthrust of the collar; profile with a low curve; front smooth and shining; the frontal fissure appearing as a short impressed line above the upper level of the antennal sockets, never extending down onto spatium frontale; the latter tending to be broad and flat, continuous in plane with both front and area frontalis which bridges it with the base of clypeus in one and the same plane, quite flat; but the spatium frontale varying from a broad flat bridge at level of front and base of clypeus, to a narrow ridge which may be depressed below that level, and finally to a fine median carina on face; antennal fossae separated, usually very pronounced, deep and round, being bounded below by the concave and steeply sloping sides of the base of the clypeus, the disc of which is prolonged upwards medially as a broad but tapering strip to joint the area frontalis (see Haupt's fig. 82[4]); disc of clypeus flat, but not always so, usually elevated, its apical part either deflected over the base of the mandibles or projecting forward as a broad free plate; labrum concealed or nearly so; mandibles broad at base, the outer basal surface sloping upward to the level of the disc of clypeus, at which point the sides of the great median lobe of the latter may make a little notch, as described by Haupt; the mandibles with one tooth on inner margin, a fimbriate groove extending to this tooth, but not all the way to base of mandible, a ridge separating basal part of upper surface from outer surface;

[4] Mitt. Zool. Mus. Berlin, XVI, 1930.

the latter hairy, a group of three or four bristles at apex of the hairy surface; a strong lamina on apical half of lower margin subtended by a fimbriate groove, which does not extend to apex; maxillary palpi not elongate in *Psorthaspis* or *Ctenocerus,* the apical segments long and slender in *Dromopompilus;* scape flattened, carinate in front, smooth, curved.

Curve of dorsum very gentle, reaching to about same height as the vertex, much of it occupied by the definitely dorsal surface of pronotum, which is a little broader than long (collar included) and usually longer than mesonotum; in profile the anterior part dips very slightly to the collar, which is almost at the same level medially, and the center of which is produced forward and upwards almost to the top of the hind surface of the head; metapostnotum usually short and medially more or less concealed in a deep incision, but in *Ctenocerus* long, not concealed in a depression, divided by a median furrow and with a deep fossa on each side; propodeum with pronounced dorsal and oblique or concave posterior surfaces, smooth or corrugated.

Front femora not incrassate; front tibiae with a few spines along the posterior border of the lower surface and at apex; tarsal segments 1 to 4 with a median comb of spines underneath, and those of front tarsus with short spines along posterior side, no comb; ultimate segment of tarsi with paired spines underneath (*Ctenocerus*) which become reduced in number (*Psorthaspis*) and eventually disappear; tarsal claws all similar, toothed, the tooth oblique or erect; hind femora with or without preapical spinules; apex of hind tibiae with a row of short equal spines (*Ctenocerus*) or a few unequal spines (*Psorthaspis*) or none at all (*Dromopompilus*). Wings with three submarginal cells, the 2d recurrent vein received at the middle of the 3rd; 2d discoidal cell with (*Psorthaspis*) or without (*Ctenocerus*) a basal pocket; *Dromopompilus* is brachypterous.

♂. Mandibles as in ♀; disc of clypeus with merely a slight tendency towards being raised and flattened; antennal fossae not deep as in female, and not separated from one another or at most separated by a fine, low, median carina; area frontalis never forming a flattened bridge between clypeus and front; occipital carina not coming close medially to the top of the posterior surface of the head, as in the female. Scape (Plate IV, fig. 31) slightly curved, short, not flattened, the other antennal segments short and thick, the flagellum laminate and bipectinate in *Ctenocerus.*

Dorsum comparatively flat, the pronotum long, but with a pronounced anterior vertical surface, the collar at a much lower level, not elevated medially, without a streptaulus in the center. Propodeum long, low, comparatively flat, the posterior surface somewhat excavated, its lateral margins a little prominent but rounded and never dentate; surface of propodeum smooth, with even contours.

Anterior claws usually asymmetrical (Plate IV, fig. 28), the front claw of each pair having the outer ray more strongly curved, more distant from the basal lobe, which is broad and rounded, while on the hind claw instead of a

lobe it is a normal tooth; the front claw considerably shorter than its mate; in some species this asymmetry is only slightly evident. In *Psorthaspis* the upper surface of the hind femora with preapical spinules, and the apex of the hind tibiae with spines of different length.

The apical sternites and genitalia differ markedly in *Ctenocerus* and *Psorthaspis;* those of the latter will be described under the genus.

The preceding descriptions have been drawn to include the type genus (*Ctenocerus*), the American forms, and the females of the Ethiopian brachypterous genus *Dromopompilus*. I have not studied the other Ethiopian genera, and those may necessitate some modification.

Distribution.—Ethiopian, Nearctic and Neotropical Regions.

PSORTHASPIS Banks

1798. *Pompilus* Fabricius, Suppl. Ent. Syst., p. 212, et auct., in part, (nec Schneider, 1784, in Mollusca).
1869. *Ferreola* Cresson, Proc. Boston Soc. Nat. Hist., VII, p. 376, et auct., (nec Lepeletier, 1845).
1872. *Parapompilus* Cresson, Trans. Amer. Ent. Soc., IV, p. 206, et auct., (nec Smith, 1855).
1897. *Planiceps* Fox, Entom. News, VIII, p. 33, (nec Latreille, 1822).
1897. *Pedinaspis* Fox, Entom. News, VIII, p. 33, (nec Kohl, 1884).
1911. *Pedinaspis* (Psorthaspis) Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.
1919. *Psorthaspis* Banks, Bull. Mus. Comp. Zool., Harvard Univ., LXIII, p. 230.
1930. *Idopedinaspis* Haupt, Mitt. Zool. Mus. Berlin, XVI, pp. 724 and 783, figs. 82 and 84c. New synonymy.
1936. *Idopedinaspis* Haupt, Boll. Istit. Entom. R. Univ. Bologna, IX, p. 75.

GENOTYPE: *Ferreola laevifrons* Cresson, by original designation.

♀, ♂. The description of the genus is embodied in that of the tribe, except as regards the terminal segments and genitalia of the male.

The abdomen of the male compressed apically, the tergites wrapping concentrically around and largely concealing the more apical small sternites; sternite 7(6), as usual, emarginate at apex, with a small chitinized hook on each side of the emargination, sternite 8 concealed, its apex chitinized and either straight, a little concave or forming a tongue-like lobe underlying the base of sternite 9 (apparent 7); the latter with a bilobed concealed basal portion and a median basal apophysis (Plate III, figs. 1–21) and the exposed apical and heavily chitinized part short and narrow, at base usually with a sharp tooth on each side, beyond which it usually tapers to a blunt point, or is in some species very short and stubby; it is strongly compressed, forming a median ventral keel, which in profile is convex and tapered toward apex, or in some species widened and truncate.

The very short parameres (Plate III, fig. 22) are characteristic of the entire genus, they (Plate III, figs. 25–33) may taper from a broad base, be stalked and enlarged at apex, or parallel-sided and truncate; the aedeagus a single slender organ, flattened in a horizontal plane, as long as the parapenial lobes, which are compressed vertically, blade-like, and have a dorso-ventrally widened apical head; the volsellae (Plate III, figs. 23 and 24) strap-like, widened and a little twisted at apex, about as long as the aedeagus and in some species with a head rather abruptly widened mesad, and somewhat pointed; the cuspis volsellaris small, unciform or truncate.

The phallus of the European genus *Pedinaspis* (Plate IV, fig. 32) is of a very different type: the parapenial lobes and the volsellae are stalked and capitate, the parameres slender, as long as the parapenial lobes, with a hyaline area on the apical part of the inner margin (as in *Chelaporus*) and the aedeagus is spatulate.

The males of *Psorthaspis* resemble those of *Nannopompilus* and *Sophropompilus,* with which they have sometimes been confused. They may be separated by the structure of the mandibles, which in those genera do not have a fimbriate groove subtending a lamina along the outer half of the inferior margin. They differ in minutiae of facial conformation and other characters which are more readily appreciated by experience than description. The male genitalia of those genera are of a totally different type, the parameres not short as in *Psorthaspis,* the volsellae sickle-shaped, and the aedeagus broadly spatulate.

Banks erected *Psorthaspis* as a subgenus of *Pedinaspis* for "*Parapompilus laevifrons* Cresson type." *Parapompilus laevifrons* Cresson, 1872, was cited by that author for two specimens from Texas; it was a misidentification of *Ferreola laevifrons* Cresson, 1869, from Mexico, which was cited in the synonymy, so that it is clear that Cresson's intent was not to create a new species (no description was given) but to transfer *laevifrons* to *Parapompilus* and to record Texan material.

The true *laevifrons* from Mexico does not possess the characters for which the subgenus *Psorthaspis* was created. Banks intended to found *Psorthaspis* on the Texan species which I describe below as *cressoni.* However, since the type was stated to be *laevifrons* Cresson, it would require an action of the International Commission on Zoological Nomenclature to change it to *cressoni,* and the matter, for reasons indicated below, does not seem of sufficient moment for such action.

Haupt, 1930, established *Idopedinaspis* for the New World species placed by Fox and subsequent writers in *Pedinaspis*. In 1936 he designated *laevifrons* Cresson the genotype.

In studying the American species formerly placed in *Pedinaspis*, I have come to the conclusion that although they show strong structural differentiation, the structures so overlap that subgeneric differentiation is not advisable.

Reasons for Transferring Psorthaspis from the Pedinaspini to the Ctenoceratini

a). The structure of the pronotum of the female of *Pedinaspis* may be described as normal for that of many Pompilidae. There is a transverse plate, dorsal in aspect, in profile almost flat, and in that view meeting almost at right angles a smooth vertical surface against which the occiput fits. Far below the level of the dorsum this vertical face again turns forward and becomes horizontal, forming a short collar over the neck. This collar is usually separated from the rest of the pronotum by the streptaulus. In *Pedinaspis* this groove is poorly formed. Normally it is continued across the pleural surface of the pronotum, and may turn vertically upward, passing forward of the spiracular tubercle.

In *Ctenocerus* females, the collar is raised to the level of the dorsum and is continuous with it, there being in profile only a slight break between its dorsal outline and the curve of the dorsum proper, therefore no vertical surface, and the streptaulus is not evident. On the pleural surface of the pronotum the streptaulus is complete, deep, passing upward in front of the tubercle.

In *Dromopompilus* females, a similar condition occurs, but here the collar is produced medially in a blunt point behind the occiput, its surface actually sloping upward a little more than that of the dorsum, and a definite basin occupies the position of the streptaulus. On the pleural surface the latter is poorly defined and disconnected from the deeply marked obliquely vertical limb in front of the tubercle.

In *Psorthaspis* females, the anteriorly produced dorsal surface of the pronotum is medially continuous in plane with the collar, and the streptaulus is wanting across the median half of the anterior width of the pronotum, but preserved on each lateral fourth,

where the collar drops away somewhat, so that the central portion of the collar is more elevated than the sides. On the pleural surface the streptaulus is distinct anteriorly, but soon fades out and as in *Dromopompilus* is not connected with the short oblique antetuberclar furrow, which is indistinct in some species.

b). In *Ctenocerus* females, the scape is flattened and curved, bluntly keeled on the lower side, its surface bare, smooth and polished. In *Dromopompilus* the same condition obtains. So it does in all *Psorthaspis,* the edge becoming more pronounced and knife-like in some species.

In *Pedinaspis* females, the scape is also curved, but not flattened, and without an edge.

c). The front of *Ctenocerus* females, presents a very unusual condition: its outline forms in profile an unbroken continuous curve with the clypeus, the two being connected by a median bridge involving indistinguishably both area frontalis and spatium frontale; this bridge separates the deep antennal fossae; it is precisely continuous in level with both front and clypeus, is flat, and has a smooth polished surface like that of those two sclerites. In *Dromopompilus* it is the same, the bridge being even broader. In *Psorthaspis planata* the condition is also the same; in *P. cressoni* the bridge is reduced to a median ridge; in *P. vicinus* there is scarcely any ridge, the antennal fossae being continuous.

In *Pedinaspis* the condition is not at all similar. The surface of the front is very slightly elevated before the base of the antennae, and then forms somewhat of a tubercle on each side into which an antennal socket is sunk; these tubercles are separated by a median furrow, and between the antennae descend abruptly as in *Aporus* to the lower level of the antennal fossae, which are not divided, there being no trace of a bridge connecting front with clypeus.

d). The peculiar type of clypeus of most *Psorthaspis* is shared by *Ctenocerus* and *Dromopompilus,* also by some *Pedinaspis.*

These similarities point to close genetic relationship between *Ctenocerus* and *Psorthaspis* which can not be explained merely as convergence. I shall discuss elsewhere the significance of the characters that have caused Haupt to place them in separate subfamilies, with the conclusion that a phylogenetic classification must align Haupt's "Claveliinae" exclusive of Calicurgini with the

Pompilinae. There is a materially lesser degree of relationship between *Pedinaspis* and *Psorthaspis* which should not both be included in the same tribe.

Evolutionary lines within the genus

The species of *Psorthaspis* that have females with dark wings and black integument covered with a minute appressed tomentum that yields rich blue, purple, violet or green reflection are primitive; this is a wide-spread condition in the family, and departure from it is a specialization. There have been three lines of color modification in the female sex: a) the development of a dense, comparatively long, orange to white, matted tomentum on parts of the body and even wings, obscuring the underlying integument; b) the development of extensive areas of orange or ferruginous integument, eventually involving practically the entire body; c) the development of clear areas on the wings, resulting in transverse banding. These are not entirely distinct phylogenetic lines, for there is overlapping, and probably some of these specializations have arisen more than once. The males have been more conservative, always retaining (so far as is known) entirely black integument, but at least in species that have colored females, the pubescence of the males may become silvery and the wings hyaline.

In the females a corrugated propodeum with lateral dorsal ridges may have been primitive, in which case modification has been toward a smooth surface with even contour; the presence of spines underneath the last tarsal segment is primitive, but the primitive type of eyes probably neither reached the summit of the head, nor fell far short of it as in *cressoni,* and correspondingly the ocelli were not very low as in *cressoni* and *portiae,* nor very near the hind margin as in *vicina.*

The species may be aligned in ten rather weakly characterized groups, indicative of relationship and lines of modification. With the exception of group 2, *purpuripennis,* these are based on characters of the female; our knowledge of the males is still too meagre to add characters from that sex with more than the probability that they will hold.

Distribution.—The center of distribution of the genus in America is Mexico, the peripheral distribution has reached Southern

California, Utah, Southeastern United States north to New Jersey, the Antilles, and Colombia. Primitive forms occur in Mexico, Texas and Utah, only specialized forms in the east and Antilles, but also in Mexico and Central America. In the United States the greatest number of species are found in Texas.

Key to the Species of Psorthaspis

Females

1 a. Tomentum elsewhere than in antennal fossae in part white, orange or red and integument almost always partly so; wings often banded...13
b. Integument entirely black; pubescence and tomentum blue, green or purplish, in antennal fossae rarely silvery, wings dark, not banded...2
2 a. Wings not covered with coppery scales.....3
b. Wings except at apex, covered with coppery scales, producing a brilliant coppery red, golden and green refulgence; thorax metallic green, legs and abdomen dark violet.....**avinoffi** (Banks)
3 a. Distance between posterior margin of head and hind ocelli equal to or at most to one and one-quarter times the distance between the hind ocelli; eyes reaching top of head or nearly so (Plate IV, fig. 26)...6
b. Above distance equal to about twice the distance between hind ocelli; eyes not reaching top of head (Plate IV, fig. 24).....4
4 a. Propodeum transversely corrugated on apical surface or sides.....5
b. Propodeum not corrugated.....**cressoni** new species
5 a. Upper margin of head, from in front, truncate; last tarsal segment with a few spines underneath.....**planata** (Fox)
b. Upper margin of head, seen from in front, deeply concave; last tarsal segment glabrous underneath.....**banksi** new species
6 a. Area frontalis much narrower than spatium frontale, not flat-topped, and often sunken below the plane of the base of the clypeus, or not at all evident.....7
b. Area frontalis forming a wide flat-topped ridge, continuous with spatium frontale and base of clypeus and on the same plane as each, as in *planata*.....**morosa** new species
7 a. Inner margins of eyes incurved above, their hind margin reaching to within less than the length of the pedicel from the hind margin of the head.....8
b. Inner margins of eyes nearly parallel, not reaching to within length of pedicel from hind margin of head.....**macronotum** (Kohl)
8 a. Propodeum coarsely transverse-rugose; area frontalis sunk below level of clypeus or of spatium frontale.....9
b. Propodeum obsoletely striate, its surface evenly rounding and almost smooth; area frontalis on a plane with spatium frontale and base of clypeus.....**guatemalae** new species

c. Propodeum entirely smooth; area frontalis a fine carina, much below level of clypeus or front (if face is viewed in a horizontal position) **vicina** (Cresson)

9 a. Rugae between dorsal and posterior surfaces of propodeum interrupted by the widened apex of the dorsal median groove or furrow, contours of propodeum rough, the lateral ridges of the dorsal surface over-ridden by heavy corrugations. (Antillean) 12

b. Rugae of propodeum usually less coarse, those between the dorsal and apical faces not interrupted medially, the dorsal surface with only a linear median groove. (Mexico to Colombia) 10

10 a. Posterior face of propodeum forming a basin bounded above and laterally by a semicircular ridge that runs from one lower corner to the other, laterad of this ridge and above it the carinae sharp and strongly raised ..... **colombiae** new species

b. Posterior face of propodeum plane, not bounded by a semicircular ridge, and crossed by carinae which are weaker medially and not so coarse nor so strongly raised as in preceding 11

11 a. Tomentum reflecting purple; mesosternal laminae acute, and with a small v-shaped notch between them; apical ray of claws obliquely curved, divergent from inner tooth. Length, 17.5 mm. **laevifrons** (Cresson)

b. Tomentum reflecting green; mesosternal laminae rounded and separated by a linear incision; apical ray of claws curved almost to a right angle, approximately parallel to inner tooth. Length, 24 mm. **coelestis** new species

12 a. Tomentum with purplish tint, that of antennal fossae not silvery; median dorsal furrow of propodeum deep ... **purpuripennis** (Cresson)

b. Tomentum intense azure, that of antennal fossae silvery; median dorsal furrow of propodeum shallow ..... **hispaniolae** new species

13 a. Forewings banded or spotted 19

b. Forewings uniformly dark 14

14 a. Propodeum corrugated or striate at least along lateral ridges of posterior face 17

b. Propodeum smooth, not striate, or with a mere trace of striation along lateral ridges of posterior face 15

15 a. Thorax and propodeum entirely black; distance from posterior margin of head to hind ocelli equal to from one to one and a half times the distance between the latter 16

b. Thorax and propodeum orange; distance from posterior margin of head to hind ocelli equal to two-thirds the distance between the latter **sanguinea** (Smith)

16 a. Entire abdomen beyond first segment orange-red; eyes reaching top of head and within the length of the pedicel of its hind margin **texana** (Cresson)

b. Only tergite 3 orange; eyes not reaching top of head and falling short of its posterior margin by twice the length of the pedicel **brimleyi** (Malloch)

17 a. Pronotum and mesonotum red or orange, without noticeable tomentum; hind ocelli placed close to top of eyes, a little more than one-half as far from the posterior margin of the head as they are from one another, their diameter equal to about one-quarter their distance apart **nigriceps** (Banks)

b. Pronotum, mesonotum and usually upper part of head covered with long, very dense conspicuous tomentum, orange, yellow or buff; ocelli placed far below tops of eyes, nearly or quite twice as far from hind margin as their distance apart.....18

18 a. Last four tergites densely covered with orange, yellow or buff tomentum **portiae** (Rohwer)

b. Last two tergites with black vestiture.....**formosa** (Smith) variety

19 a. Integument of pronotum and mesonotum not concealed by long and dense tomentum, but visible through a microscopic tomentum that gives a sheen to the surface.....25

b. Pronotum, at least in half, and often mesonotum concealed by long, dense, and often matted yellow, buff or white tomentum; calcaria black 20

20 a. Tergites 3 and 4 black or orange, not obscured by dense tomentum...21

b. Tergites 3 and 4 densely covered by long orange tomentum; tergite 2 black, with white pubescence at sides of base, 5 and 6 black without gray pubescence; pronotum, mesonotum and upper part of head entirely covered with dense orange tomentum.....**formosa** (Smith)

21 a. Dorsal surface of pronotum continuous with collar; tergites 2 and 4 black; tergite 3 spotted or banded; tergites 5 and 6 or both with gray or white pubescence; mesonotum sometimes with yellow tomentum.22

b. A small triangular glabrous surface perpendicular to dorsum between dorsum and collar; tergite 2 with two orange spots; tergite 3 black; tergite 4 and base of 5 orange; tergites 5 and 6 without gray pubescence; mesonotum with black tomentum...**bioculata** new species

22 a. Pronotum entirely covered with yellow tomentum.....23

b. Only posterior half of pronotum covered with yellow tomentum; tergite 3 with an orange band occupying the length of the segment, notched medially, not reaching sides; distance between hind ocelli about three-quarters their distance from hind margin...**picta** (Kohl)

23 a. Mesonotum and scutellum yellow tomentose.....24

b. Mesonotum and scutellum not yellow tomentose; propodeum and pleura silvery.....**bugabensis** (Cameron)

24 a. Tergites 3 and 4 with apical white bands (or bands of white pubescence?).....**impudica** (Cameron)

b. Tergite 3 with two lateral ivory spots; tergite 4 black; distance between hind ocelli equal to their distance from hind margin of vertex **canipennis** new species

25 a. Integument of thorax orange or ferruginous.....27
b. Integument black, that of tergite 3 sometimes ferruginous.....26
26 a. Tergite 3 pale ferruginous, otherwise black, the propodeum above and laterally and the tergite 1 covered with silvery white pubescence; under surface thinly covered with ashy pile. (Mexico) **variegata** (Smith)
b. Integument entirely black; the front legs, prothorax, mesothorax, tergite 2 and two oblique stripes on tergite 3 covered with short black velvety pubescence, showing a purple iridescence, other parts including middle and hind legs densely covered with very short white pubescence. (Antilles).....**naomi** (Smith)
27 a. Legs not densely covered with cinereous pile. Southeastern United States 28
b. Legs piceous-black, covered with a very dense cinereous pile, as is also the first segment of abdomen (except dorsal middle), a small spot on each side at base of tergite 2, the extreme sides of tergite 3, the apical margin of tergite 4 and all of tergites 5 and 6. (Cuba) **elegans** (Cresson)
28 a. Calcaria white.....29
b. Calcaria black; head (except sometimes clypeus) black; 3d tergite without a transverse cream-colored band or spots.....**mariae** (Cresson)
29 a. Abdomen black, except for a large pale yellow spot on each side of tergite 3, and a pale basal band on 3, legs reddish yellow; fifth and sixth abdominal segments and sides of propodeum silvery **lucutosa** (Banks)
b. Abdomen red to orange-yellow but the apex of tergite 2 and tergites 3 to 6 usually black, if not, the pile on them is black, more or less cinereous on the last two; tergite 3 with a transverse, cream-colored band, usually interrupted medially, and 4 with transverse, basal, cream-colored spots which may be hidden under the margin of 3 **legata** (Cresson)

Males

1 a. Wings hyaline, or the apex infuscated; vestiture more or less cinereous 7
b. Wings uniformly dark fuscous; vestiture dark, the tomentum with purple, blue or green reflection.....2
2 a. Surface of vertex rounded or slightly elevated; not Californian.....3
b. Surface of vertex between and behind posterior ocelli forming a strongly elevated, somewhat acute hump. (California) **planata** (Fox)
3 a. Ocelli not unusually large, the tops of the eyes and the hind ocelli each removed from the hind margin of the head by much more than the diameter of the ocelli. (Texas and Mexico).....4
b. Ocelli very large, the hind pair less than their diameter's length from the hind margin of the vertex, as is also the top of the eyes; reflection of thorax a brilliant metallic blue-green. (Jamaica) **avinoffi** (Banks)

4 a. Apical ray of anterior claw of each front pair scarcely more curved or shorter than that of the posterior claw; seen from in front the outline of the vertex is curved upwards at sides above eyes, forming a break with their outer outline, then connected nearly straight across (Plate IV, fig. 25).....5

b. Apical ray of anterior claw of each front pair much more strongly curved and shorter than that of the posterior claw; seen from in front the outline of the vertex forms an unbroken arc with that of the outer orbits (Plate IV, fig. 27).....**vicina** (Cresson)

5 a. Pubescent inferior part of last sternite (in profile) widened and rounded or subtruncate at apex, not produced beyond the apex of the smooth and glabrous dorsal surface (Plate III, figs. 1 and 2).....6

b. Pubescent inferior part of last sternite forming a tapering horn produced far beyond apex of the smooth and glabrous dorsal surface (Plate III, fig. 6); parameres (Plate III, fig. 28) a little clavate, obtuse; volsellae with a pointed head, deflected mesad **cressoni** new species

6 a. Parameres (Plate III, fig. 26) somewhat enlarged and obtuse at tip; volsellae rounded and slightly deflected mesad at apex, but without a distinct head.....**nahuatlensis** new species

b. Parameres (Plate III, fig. 25) truncate; volsellae with a pointed head which is deflected mesad.....**levis** new species

7 a. Calcaria black.....8

b. Calcaria white.....**legata** (Cresson)

8 a. Vertex convex, if with a weak hump it is in profile low and rounded..10

b. Vertex forming a strong hump, in profile sometimes somewhat pointed..9

9 a. Wings infuscated at apex; apical half of propodeum, basal half of tergite 1 and 2, and all of 3 to 6 densely white tomentose **alternata** (Banks)

b. Wings entirely hyaline, white hair not gathered in a definite pattern **conocephala** new species

10 a. Last sternite with a basal tooth on each lateral margin (Plate III, figs. 5 and 10); parameres (Plate III, figs. 27 and 32) truncate.....11

b. Margins of last sternite entire (Plate III, fig. 8); parameres (Plate III, fig. 30) tapered.....**magna** (Banks)

11 a. Lateral teeth of sternite 9 (Plate III, fig. 10) weak, the inferior margins of that sternite in profile (Plate III, fig. 21) strongly convex; the apex of sternite 8 produced in a liguliform lobe underlying the base of 9.....**mariae** (Cresson)

b. Lateral teeth of sternite 9 (Plate III, fig. 5) large, the inferior margin in profile (Plate III, fig. 15) less convex; the apex of sternite 8 (underlying the base of 9) truncate or a little concave **australis** (Banks)

Species-Group 1, *morosa*

♀ and ♂ with black integument, microscopic purplish tomentum, dark wings; ♀: the eyes reaching well up on to the vertex, the propodeum corrugated and its dorsal surface with lateral swellings overridden by corrugations. ♂: Sternite 9 in profile (Plate III, figs. 12 and 13) short and thickened towards apex.

The species of this group, especially *P. morosa,* presumably are the most primitive of the genus.

Psorthaspis morosa new species

♀. Integument black, most of head, body and legs covered with a minute tomentum that reflects purple; a few short erect hairs on head, pronotum, propleura, coxae, abdomen beneath and towards apex. Wings fuscous with dull violaceous reflection.

Head measurements: a 48, b 50, c 29, d 27, e 33, f 22, h 13, i (median lobe) 20; profile of head almost an even arc from vertex to bases of antennae; the eyes inflated but the anterior outline of the front, seen from above, in the same plane with their surface; area frontalis forming a broad flat-topped bridge between spatium frontale and disc of clypeus, in the same plane as each and all quite flat, smooth, and polished, the surface of the clypeus absolutely flat and plate-like with no apical deflection whatsoever, the apical margin nearly truncate, the sides oblique; frontal fissure a very short impression at upper level of antennal fossae; posterior margin of head seen from in front convex, from above nearly straight, very slightly concave; hind ocelli placed far below level of summits of eyes; ocellar measurements: a 35, b 5, c 27, d 31; distance from corner of eye to hind margin about 7. Antennal measurements: 13:3:12:11.

Dorsal measurements: a 35, b 45, c 20; side margins of pronotum curved, convergent anteriorly, the humeri not prominent; dorsal surface of pronotum not margined laterally, continuous in level with collar; streptaulus extending obliquely downward on lateral pieces of pronotum to middle; a pit in front of spiracular tubercles; a V-shaped notch between apical laminae of mesosternum; dorsal surface of propodeum continuing the gentle curve of dorsum, its surface medially smooth, without median groove, with lateral swellings and behind them the lateral furrow, both overridden by corrugations; hind surface oblique, separated by an arcuate carina from the dorsal, smooth in center, the sides and posterior part of lateral faces coarsely corrugated. About five spines, alternately short and long, on posterior margin of under surface of front tibiae, the last two situated on margin of articulatory incision, apical spinules minute; a row of short spines along posterior edge of metatarsus; under surface of ultimate segment of all tarsi with only apical spines; hind femora devoid of spinules on upper surface. Length, 16 mm.

Holotype.—Female; Utah; [U. S. Nat. Mus.].

Psorthaspis levis new species (Pl. III, figs. 1, 12 and 25.)

♂. Integument black; tomentum with blue-green reflection, vestiture otherwise black. Wings fuscous, without reflection.

A fine, weak, median carina on face; clypeus elevated, its base almost transversely depressed, the basal margin arcuate, the disc nearly flat, its lateral and anterior margins forming a continuous arc; ocellar measurements: a 14, b 5, c 16, d 20. Front claws scarcely asymmetrical; longer hind tibial spur .55 as long as metatarsus.

Sternite 9 with prominent lateral teeth, the apical part of the smooth and glabrous dorsal surface forming a triangle with the teeth as its basal angles, slightly broader at base than its sides are long (Plate III, fig. 1), the hairy under part not forming a lobe projecting beyond this triangle, the under part with a median carina, and in profile (Plate III, fig. 12) broadened and subtruncate. Parameres (Plate III, fig. 25) not flattened, the apical part in lateral view slightly widened, obliquely truncate, bristly below and ciliate at apex; volsellae as in *cressoni;* cuspis volsellaris uncinate; aedeagus slightly spatulate. Length, 8.5 to 10 mm.

On account of the similarity in the last sternite, this probably belongs to the same group as *nahuatlensis,* and that seems most likely to be the *morosa* group. *Levis* might even be the male of *morosa.*

Holotype.—Male; San Diego, Duval Co., Texas; April 30; [U. S. Nat. Mus.].

Paratype.—1 ♂, with same locality but May 1, [Acad. Nat. Sci. Phila.].

Psorthaspis guatemalae new species

♀. Integument black; head, body and legs largely covered with minute tomentum yielding a green to violet reflection; erect hair as in *morosa;* wings fuscous with dull violaceous reflection.

Eyes reaching top of head; head measurements: a 37, b 41, c 24, e 26; lower half of front flat in profile; frontal fissure a finely impressed line, not extending below level of upper margins of antennal sockets, nor above to center of front; area frontalis forming an acute ridge, that connects front and clypeus on the same plane; disc of clypeus depressed apically toward the mandibles, its corners more strongly, its lateral margins strongly oblique, its apical margin nearly straight; in front view the posterior margin of head convex from the corner of one eye to that of the other, from above subacutely concave; ocelli but little below level of tops of eyes; a distinctly depressed or flattened strip from each hind ocellus to the eye, but the area between the ocelli not elevated; ocellar measurements: a 15, b 6, c 17, d 23. Antennal measurements: 12:2:8:7.

Dorsal measurements: a 28, b 36, c 17; lateral margins of dorsal surface of pronotum margined by rounding ridges, stronger posteriorly, nearly parallel, slightly curved, the humeri moderately prominent; dorsal surface continuous with center of collar; streptaulus present on anterior third of lateral pieces of pronotum; a fossa in front of spiracular tubercles; laminae of mesosternum with a narrow slit between them. Propodeum nearly as in *macronotum,* the lateral swellings less evident, the oblique fossae not distinct, and the corrugations still weaker than in that species; legs spined as in that species except that the ultimate segment of the hind and middle legs is devoid of spines beneath, except the apical pair; claws with the outer ray a little more strongly curved than in preceding species. Length, 14 mm.

Holotype.—Female; Trece Aguas, Alta Vera Paz, Guatemala; November, 1905; (G. P. Goll); [U. S. Nat. Mus.].

Psorthaspis macronotum (Kohl) new combination

1886. *Pompilus macronotum* Kohl, Verh. K. K. Zool-botan. Gesellsch. in Wien, XXXVI, p. 336. ♀. [Mexico: Cuernavaca.]

1911. *Pedinaspis macronotum* Schulz, Zool. Annalen, IV, p. 119.

♀. Integument black, head, body and legs nearly everywhere covered with a fine tomentum yielding a strong blue to blue-green reflection; head, pronotum, propleura, coxae, and abdomen beneath and towards apex with sparse, erect, black hairs. Wings fuscous with dull violaceous reflection.

Head measurements: a 49, b 53, c 34, d 36, f 19, h 14; upper part of profile of head curving, but straight on lower part of front; spatium frontale flat, bridged in the same plane to the flat clypeus by the area frontalis, which is a narrow ridge, not flat-topped; clypeus perfectly flat, not at all deflected anteriorly, its lateral and apical margins forming an unbroken semicircular arc; posterior margin of head sharp, as seen from in front nearly straight, except at sides, from above slightly concave; hind ocelli much below upper level of eyes; ocellar measurements: a 35, b 9, c 27, d 34. Antennal measurements: 14:3:9:10.

Dorsal measurements: a 37, b 45, c 25; dorsal surface of pronotum continuous with central part of collar, sides margined by a weak, rounding ridge, convergent and covered anteriorly, the humeri not prominent; streptaulus wanting in center of collar, continued on side-pieces of pronotum not to center, and less obliquely downwards than in *morosa;* laminae of mesosternum acute, depressed medially. Dorsal surface of propodeum smooth except at sides, its apical half with a median furrow, its lateral swellings and oblique fossae weak, faintly overridden by carinae; posterior face not set off by a carina, its upper and lateral parts evenly but not coarsely transversely corrugated, the lower median part smooth, the side-angles not prominent, these and posterior part of lateral faces also corrugated, but not coarsely. Legs spined as in *morosa,* except that only the two longer spines are present on the margin of the front tibiae, and the ultimate segments of the hind and middle tarsi have several pairs of spines underneath; the hind femora lack

preapical spinules; claws with an erect tooth and moderately curved apical ray. Length, 17 mm.

Distribution.—MEXICO: Morelos—Cuernavaca, (*type*[5] presumably in the Naturh. Mus. Wien); 1 ♀, July 7, 1900, (C. C. Deam), [U. S. Nat. Mus.].

Psorthaspis laevifrons (Cresson)

1869. *Ferreola laevifrons* Cresson, Proc. Boston Soc. Nat. Hist., XII, p. 376. Pro parte. ♀. [Mexico: Orizaba.]
1893. *Pompilus laevifrons* Cameron, Biol. Centr.-Amer., Hymen., II, p. 189.
?1893. *Pompilus telemon* Cameron, Biol. Centr.-Amer., Hymen., II, p. 186. ♀. New synonymy.
1897. *Pompilus levifrons* Dalle Torre, Catal. hymen., VIII, p. 298.
1897. *Pompilus* (*Pedinaspis*) *laevifrons* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*Psorthaspis*) *laevifrons* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.
?1911. *Pedinaspis telemon* Schulz, Zool. Annalen, IV, p. 120.
1936. *Idopedinaspis laevifrons* Haupt, Boll. Istit. Entom. R. Univ. Bologna, IX, p. 75.

♀. Integument black, the head, body, legs and wings reflecting a brilliant purple of about the same shade as *purpuripennis*, a small amount of erect hair on vertex, under head, on propleura, front coxae, pronotum, under abdomen and on last tergite. Wings dark with strong reflection.

Head measurements: a 45, b 51, c 25, d 25, e 30, f 25, h 13, i 22 (lobe 18); eyes a little inflated above level of front, reaching the hind condyle of the mandibles; profile strongly curved, so that the ocelli and tops of the eyes are well on the upper surface; area frontalis a very narrow ridge or carina, slightly separating the antennal fossae, and connecting the front with the clypeus but depressed below the level of either, neither being very flat; base of sides of mandibles sloping up to level of clypeus, the apical part of which is slightly deflected to fit closely above them; median lobe of clypeus with convergent sides, apical margin straight, no distinct lobe at base of its sides; labrum slightly exposed; frontal fissure a short, fine, wedge-shaped impression, situate about the length of the pedicel above the spatium frontale; front ocellus in a slight depression, vertex flattened posterolateral of each hind ocellus; posterior margin of head seen from in front straight, from above concave, a little less than length of the pedicel from the eye-margins; ocellar measurements: a 19, b 9, c 17, d 25. Antennal measurements: 14:4:10:10.

Dorsal measurements: a 31, b 46, c 22; side margins of dorsal surface of pronotum convex, convergent anteriorly, the margining ridges weak, rounding, stronger posteriorly; streptaulus sharply impressed on sides of collar, humeri and less than one-half of side-pieces of pronotum; a pit in front of

[5] I have not seen the type.

spiracular tubercles; laminae of mesosternum sharp, with a V-shaped emargination between them; a pronounced tubercle at hind margin of mesopleura, just before base of coxae; propodeum as in *banksi,* except that the hind surface is not more concave above and has no pocket there; spiracles somewhat crescent-shaped but the outer margin straight.

Spines of fore legs as in *purpuripennis;* last tarsal segment without spines beneath. Abdomen compressed apically. Length, 17.5 mm.[6]

Distribution.—MEXICO: Orizaba, 1 ♀, [*lectotype,* Acad. Nat. Sci. Phila.]. GUATEMALA: 1 ♀, [Mus. Comp. Zool.]. Sacatepequez—Antigua, 1 ♀, June 17, 1923, (E. G. Smyth), [U. S. Nat. Mus.]. Izabal—Livingston, 1 ♀, April 18, 1923, (E. G. Smyth), [U. S. Nat. Mus.].

Psorthaspis nahuatlensis new species (Pl. III, figs. 2, 13 and 26.)

♂. Integument entirely black, the tomentum with blue-green reflection, this also noticeable on the basal part of the wings, the latter fuscous, with dull violaceous reflection.

Base of clypeus moderately depressed, arcuate, the disc nearly flat, sides of apical lobe oblique, the anterior margin almost straight; ocellar measurements: a 18, b 5, c 21, d 26. Front claws scarcely asymmetrical. Longer hind tibial spur two-thirds as long as metastarsus.

The ninth sternite (Plate III, fig. 2) with two prominent lateral teeth, and the apical part of the smooth and glabrous dorsal surface forming a triangle with these two teeth as its basal angles, slightly wider at base than its sides are long, the pubescent lower part not projecting beyond this triangle, with a broad, flat, median carina, and in profile widened and rounded apically (Plate III, fig. 13). The parameres (Plate III, fig. 26) with a comparatively long, slender stalk, a slightly enlarged and obliquely obtuse head, not flattened, setose below and ciliate at tip; the volsellae flattened, a little twisted, rounded at apex, about as in *vicina;* the cuspis volsellaris unciform; aedeagus slender and notched at tip. Length, 9.5 to 10.5 mm.

This may be the male of *laevifrons* (Cresson), and must belong to the same group as *levis.*

Holotype.—Male; Mexico; [U. S. Nat. Mus.].

Paratypes.—2 ♂, Mexico, [Acad. Nat. Sci. Phila.; U. S. Nat. Mus.].

Psorthaspis coelestis new species

♀. Integument black, covered with a dense short tomentum reflecting green (diamine green).

Head measurements: a 61, b 66, c 36, d 34, e 42, f 30, h 19, i (median lobe) 23; ocellar measurements: a 32, b 10, c 25, d 40; antennal measure-

[6] Description drawn from type.

ments: 20:4:13:12; dorsal measurements: a 50, b 72, c 34. In other respects differs from the description of *laevifrons* as given above as follows: eyes on level of front; ridge formed by area frontalis on level with front; barely below that of clypeus; laminae of mesosternum rounded, divided by a slit; lateral tubercles of dorsal surface of propodeum less evident, more of a depression mesad of postero-lateral angles, the dorsal surface with a median groove; ultimate segment of hind and middle tarsi with one or two pairs of spines underneath before the apical pair; posterior femora with three or four preapical spinules; claws with outer ray curved until almost perpendicular, parallel to inner tooth. Length, 24 mm.

Holotype.—Female; San Carlos, Alajuela, Costa Rica; (Schild and Bergdorf); [U. S. Nat. Mus.].

Psorthaspis colombiae new species

♀. Integument entirely black, covered with minute appressed blue-green tomentum, giving a greenish sheen; front, vertex and pronotum with erect black hair, also on propleura and front coxae, and some longer hairs at apex of abdomen; antennal fossae with some short white pile. Wings brown, with dull violaceous reflection.

Clypeus flat, its median lobe rather short and broad, anterior margin truncate, sides sloping, connected to front by a narrow sharp ridge, not in precise plane of clypeus and front, the clypeus slightly depressed medially at base; antennal fossae pronounced, narrowly separated, sloping gradually into clypeus; eyes reaching top of head, and to within little more than the length of the pedicel from the hind margin, a little convergent above, not hairy, leaving a mere line as malar space at posterior condyles, wider in front; from front view the upper outline of head evenly convex, from above the posterior margin broadly concave; hind ocelli equidistant from hind margin and from each other, a little farther from eyes; frontal groove distinct halfway to lower ocellus, impression below latter and those at sides of hind ocelli poorly defined. Third segment of antenna slightly longer than 4th.

Median line of pronotum in profile continuous with that of collar, almost without a downward dip; streptaulus interrupted medially, not continued upwards on sides of pronotum, but a pronounced pit in front of spiracular tubercle; sides of upper surface of pronotum margined by a weak roll posteriorly; metapostnotum in a deep depression over which the metanotum projects, not completely concealing the former; mesopleura raised and somewhat acutely tuberculate at side of coxae; mesosternum with only a small notch at apex. Dorsal surface of propodeum smooth, velvety, except at apex, the lateral swellings present, forming somewhat prominent hind angles; spiracles large, without tubercles; hind face concave, limited by a rather sharp semi-circular ridge extending from one lower corner to the other; the sharp coarse carinae of the posterior part of the lateral faces extending around and crossing this ridge, disappearing just mesad of it; one carina

crossing without interruption above it. Tooth on tarsal claw at right angles to the claw, and almost parallel to the strongly incurved apical ray, nearly as long as latter. Length, 13 mm.

Holotype.—Female; San Lorenzo Mts., Partidas Cincinnati, Magdalena, Colombia; January 1, 1923; (M. A. Carriker); [Mus. Comp. Zool.].

Species-Group 2, *purpuripennis*

The females of this group differ from those of the preceding in having the ridge separating the dorsal from the posterior face of the pronotum interrupted by the widened apex of the median dorsal furrow. The males (as indicated by *avinoffi*) have the 9th sternite (Plate III, figs. 3 and 14) without lateral teeth, liguliform, not compressed, and in profile long and slender.

Psorthaspis purpuripennis (Cresson) new combination

1865. *Pompilus purpuripennis* Cresson, Proc. Ent. Soc. Phila., IV, p. 130. ♀. Cuba.
1897. *Pompilus purpureipennis* Dalle Torre, Catal. Hymen., VIII, p. 313. ♀.
1911. *Pedinaspis purpureipennis* Schulz, Zool. Annalen, IV, p. 120. ♀.
1928. *Pedinaspis purpuripennis* Banks, Studies on Cuban Insects. Cambridge (Mass.), Harvard Univ. Press. 1. Notes on Cuban and other West Indian Psammocharidae, p. 10. ♀.
1938. *Pedinaspis purpuripennis* Banks, Mem. Soc. Cubana Hist. Nat., XII, p. 245. ♀.

♀. Black, the head, body, legs, and wings reflecting uniformly a brilliant purple; some short erect hair on vertex, pronotum, propleura, front coxae and under abdomen, longer on last segment of abdomen. Wings uniformly dark with strong reflection.

Head measurements: a 48, b 55, c 25, d 26, e 31, f 28, h 13, i 22 (lobe 17); eyes large, swollen, incurved at summit, occupying vertex and reaching hind margin; area frontalis obliquely depressed and forming a slender narrow ridge between antennal fossae at a lower plane than either front or clypeus; clypeus not flat, curving down apically to follow the plane of the upper surface of the mandibles over the base of which it lies closely, a little convex also from side to side, the sides of the median lobe convergent, apical margin nearly truncate; frontal fissure faint; vertex without depressions, its hind margin shallowly concave; ocellar measurements: a 20, b 11, c 18, d 22. Antennal measurements: 17:4:14:11.

Dorsal measurements: a 30, b 30, c 26; sides of pronotum curved and narrowing anteriorly, lateral margin a rounding ridge, strongest posteriorly; streptaulus sharply impressed except across middle, extending nearly half the length of the lateral pieces of pronotum; a depression in front of and somewhat above spiracular tubercles; mesosternal laminae lying close to-

gether with a narrow notch between. Propodeum with rough contours, the lateral ridges of dorsal surface pronounced and overridden by coarse corrugations, the hind surface flat, separated from the dorsal by a corrugated ridge, this interrupted medially at the wide apex of the median dorsal channel; spiracles parallel-sided and hooked at apex, deeply sunk in an elevation of the surface. Abdomen scarcely compressed. Length, 16 mm.[7]

Schultz, 1911, has recorded this species from St. Thomas; the record presumably refers to hispaniolae or to an undescribed species or subspecies.

Distribution.—CUBA: 1 ♀, (*holotype,* Acad. Nat. Sci. Phila.); Oriente—Piquo Turquino, south side, 1 ♀, June 11, 1936, 3000–5000 ft. alt., (P. J. Darlington), [Mus. Comp. Zool.].

Psorthaspis avinoffi (Banks) new combination (Pl. III, figs. 3 and 14.)

1938. *Pedinaspis avinoffi* Banks, Mem. Soc. Cubana Hist. Nat., XII, p. 25. ♀. [Jamaica.]

♀. Integument black, but so densely overlaid with microscopic tomentum, reflecting brilliantly, that the colors appear as follows: Upper part of head, dorsum of sides of thorax, and propodeum metallic green (calla green to cossack green according to lighting), the under parts of the thorax and coxae ranging from blue into violet; the legs and abdomen brilliant violet (hyacinth violet to dark violet and in poor lighting, black); scanty, short erect pale hair on head, pronotum, mesopleura and legs. Wings by transmitted light, brown, the fore wings, except the apical margin, densely covered with scales that produce in reflected light a brilliant coppery refulgence, like the surface of chalcopyrite, golden-coppery, red coppery along the veins, to brilliant green, (light bice-green shot with copper) according to lighting.

Head measurements: a 57, b 52, c 32, d 31, e 41, f 28, h 20, i 24; area frontalis forming a narrow ridge bridging clypeus to front in the same plane as each; eyes extending on to vertex; hind margin of head straight; ocellar measurements: a 28, b 12, c 21, d 35. Antennal measurements: 19:4:11:11.

Dorsal measurements: a 43, b 61, c 36; dorsal surface of pronotum vaguely margined; streptaulus marked only at sides of front margin; a depression above and somewhat in front of spiracular tubercle; laminae at apex of mesosternum pressed up between the coxae, and with only a narrow slit between them. Propodeum with a deep broad median furrow, except at base, as in *purpuripennis,* the dorsal surface with broad lateral furrows and laterad of these the lateral swellings, the apical half of the dorsal surface and all of the posterior and sides overridden by coarse rugae. Two spines along posterior surface of front tibiae underneath, the second situated in the articulatory emargination, a few spinules at apex; a row of spines along posterior side of front metatarsus and a median row beneath; no spines under last segment of any tarsi; longer hind tibial spur about two-fifths as long as

[7] Description drawn from the type.

metatarsus; a spinule before apex of hind femora, above, and several spines of unequal length, splayed out, at apex of hind tibiae. Length, 18 mm.[8]

♂. Alitrunk brilliantly metallic blue-green to green, especially as seen in sunlight or artificial light, contrasting with the purple of the abdomen, but the colors not as strong as in the female. Vestiture dark, except pubescence of antennal fossae white. Wings uniformly fuscous, with a golden bronze lustre.

Disc of clypeus convex, depressed gradually at base, the basal margins oblique, convergent upwards toward center; a fine carina dividing center of face; anterior lobe of clypeus short, with nearly straight sides, and subtruncate anterior margin; ocellar measurements: a 7, b 8, c 12, d 12.

Apical rays of both anterior and posterior claws of front pair strongly, but differently curved, the basal lobe of the anterior claw broad, rounded and farther from the apical ray than is the more acute tooth of the posterior claw. Longer hind tibial spur three-fifths length of metatarsus.

Ultimate sternite (Plate III, fig. 3) slender, liguliform, obtusely pointed, without lateral teeth, not compressed, its under surface with a median ridge but no keel, in profile (Plate III, fig. 14) slender and tapering. Parameres tapered shortly from broad base to middle, with a somewhat enlarged and obtuse head as seen from the side, truncate if seen from below, strongly bristled; volsellae, from below, broad, flattened, slightly twisted without an enlarged or deflected apical head; cuspis volsellaris uncinate, stout; aedeagus slender, parallel-sided, turned slightly upwards; enlarged part of parapenial lobes short, bluntly rounded at apex. Length, 8 mm.

When viewed in brilliant sunlight, at different angles, the female is one of the most gorgeously colored wasps that I have observed. Its closest relative is the Cuban *purpuripennis*. I am greatly indebted to Mr. Banks for borrowing the type for me to study, and to the authorities of the Carnegie Museum for loaning it.

Distribution.—JAMAICA: Corn Puss Gap, 1 ♀, July 19, 1936, [*holotype,* Carnegie Mus.]. Main Range Blue Mts., 5000–7388 ft. alt., 1 ♂, August 12, 1934, (P. J. Darlington, Jr.), [*allotype,* Mus. Comp. Zool.].

Psorthaspis hispaniolae new species

♀. Very close to *purpuripennis,* from which it differs in the following particulars: Color an intense azure reflecting brilliantly on the abdomen, without the purplish tinge of *purpuripennis;* antennal fossae silvery tomentose which is not true in *purpuripennis,* frontal groove more pronounced, side margins of dorsal surface of pronotum more prominent posteriorly; in addition to lateral furrows parapsidal furrows complete; rugosities of propodeum a little less pronounced and the median furrow much shallower. Length, 14 mm.

[8] Description drawn from holotype.

♂. Same color as ♀, wings fusco-violaceous. Length, 10 mm. I have not examined the genitalic structures.

Holotype.—Female; Constanza, Dominican Republic, 3000–4000 ft. alt.; August 21, 1938, (P. J. Darlington, Jr.), [Mus. Comp. Zool.].

Allotype.—Male; Desbarriere Mts., La Hotte, near 4000 ft. alt., Haiti; October 12, 1934, (P. J. Darlington, Jr.); [Mus. Comp. Zool.].

Paratype.—1 ♂, LaVisite and vicinity, La Selle Range, 5000–7000 ft. alt., Haiti, September 10, 1923, (Marston Bates), [Mus. Comp. Zool.].

Species-Group 3, *nigriceps*

The single species of this group differs from those of the preceding only in having the integument of the ♀ partly red. The male, unless represented by *levis,* is unknown.

Psorthaspis nigriceps (Banks) new combination

1933. *Pedinaspis nigriceps* Banks, Psyche, XL, p. 2. ♀. [New Mexico.]

♀. Eyes not reaching top of head and considerably more than the length of the pedicel from the hind margin; scarcely any malar space; as seen from in front the upper margin of head slightly concave and the hind margin from above distinctly so; distance of hind ocelli from posterior margin of head equal to more than one-half their distance apart; front ocellus in a pit; a well marked basin laterad of each hind ocellus; front in plane of clypeus and connected by a moderately broad and flat ridge in the same plane, widely separating the deep antennal fossae; clypeus flat, its anterior margin semi-ovate; head measurements: a 48, b 51, c 30, d 30, e 35, f 24, h 13, i (disc) 19; ocellar measurements: a 23, b 10, c 27, d 27. Antennal measurements: 17:3:13:12.

Dorsal measurements: a 41, b 50, c 30; sides of pronotum slightly margined by a weak rounded swelling, a little more distinct behind; streptaulus continued obliquely upward as a weak furrow above the tegulae; V-shaped median notch at apex of mesosternum quite small. Propodeum divided dorsally by a median furrow, deep enough to form two posterior lobes, its postero-lateral corners marked by an oblique swelling; spiracles straight, oblique, the anterior lip slightly raised but not forming a tubercle; no ridge between dorsal surface and the posterior or lateral surfaces, but the posterior surface with curving striae which extend slightly onto the sides. Only apical spines underneath last segment of hind tarsi. Length, 18 mm.[9]

[9] Description drawn from holotype.

Distribution—NEW MEXICO: Steins, 1 ♀, July 14, 1917, (J. Bequaert; on *Acacia gregii*), [*holotype,* Mus. Comp. Zool.]. ARIZONA: Dewey, 1 ♀, 1917, [U. S. Nat. Mus.]. UTAH: 1 ♀, [U. S. Nat. Mus.].

Species-Group 4, *planata*

The females of this group differ from those of group *morosa* and agree with the two following in having the tops of the eyes remote from the top of the head, and the ocelli placed low. The males have purplish tomentum and wholly black wings, like the females; the sternite 9 (Plate III, fig. 4) has small lateral teeth, and is lance-shaped, the sides (in dorsal view) concave and tapering to a long point, keeled but slender and tapering in lateral view.

Psorthaspis planata (Fox) (Pl. III, figs. 4 and 22; pl. V, fig. 31.)

1892. *Planiceps planatus* Fox, Ent. News, III, p. 171. ♀. [California.]
1894. *Pompilus aequus* Fox, Proc. Calif. Acad. Sci., (2), IV, p. 99. [Mexico: Baja California.] New synonymy.
1897. *Pompilus* (*Pedinaspis*) *planatus* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*P.*) *planatus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.
1917. *Sophropompilus tumifrons* Banks, Bull. Mus. Comp. Zool., Harvard Univ., LXI, p. 103. ♂. [California.] New synonymy.
1919. *Psorthaspis planatus* Banks, Bull. Mus. Comp. Zool., Harvard Univ., LXIII, p. 241.
1928. *Pedinaspis bucephala* Malloch, Proc. Ent. Soc. Wash., XXX, p. 101. ♂. [California.] New synonymy.

♀. Integument black, covered with minute tomentum reflecting blue-green or purple; with the usual amount of short erect hair. Wings fuscous with dull violaceous reflection.

Head measurements: a 50, b 50, c 30, d 29, e 32, f 19, h 14, i (disc) 19; head produced much above tops of eyes; in profile the lower part of front straight, flat, the area frontalis forming a broad flat-topped bridge in same plane with both front and clypeus; disc of latter entirely flat, projecting as a heavy free plate not deflected apically, its sides a little oblique, its apical margin broad, slightly convex, nearly straight; frontal fissure a weakly impressed short line above upper level of antennal sockets; hind ocelli placed far below tops of eyes, vertex slightly flattened laterad of each; a depression in center of posterior part of vertex; hind margin of head not sharp, seen from in front elevated and rounded laterally above eyes, nearly straight across the middle, from above slightly concave; ocellar measurements: a 40, b 6, c 23, d 32. Antennal measurements: 14:3:10:9.

Dorsal measurements: a 35, b 45, c 16; dorsal surface of pronotum continuous medially with collar, its sides marked by a weak rounding ridge, stronger posteriorly, slightly convex and convergent, but the humeri moderately prominent; streptaulus well marked at humeri and on the anterior half of side-pieces of pronotum, where it is nearly parallel with anterior margin; a weak depression in front of spiracular tubercles; mesosternal laminae small, acute, separated by a wide, shallow, acute notch. Shape of propodeum very much as in *cressoni,* and its contours apart from corrugations about the same, except that the lateral ridges are developed; sides of dorsal, posterior, and upper part of lateral surfaces corrugated, the posterior surface separated from the dorsal by corrugations which usually, as in the type, form a transverse carina, incomplete laterally; in the type the dorsal surface has a few radiating carinae abutting this transverse carina. Posterior margin of under surface of front tibiae with six spines, the last four of which are on the margin of the articulatory incision and the last three short and stout, together forming a subapical close-set row; ultimate segment of hind and middle tarsi usually with one or two pairs of spines beneath, but this somewhat variable; hind femora devoid of preapical spinules; outer ray of tarsal claws long and not strongly curved. Length, 14 to 22 mm.

♂. Entirely black; wings black with dull violaceous reflection; body and legs with appressed tomentum producing a greenish-blue sheen. Erect hair black, abundant on head and neck, elsewhere scanty and short, a very little on propodeum except at apex, on mesopleura and on tergites.

Head seen from in front ovate, rounded and but little extended above the eyes which diverge above; hind ocelli nearer to hind margin than to front ocellus and still more so than to eyes; a strong hump on vertex above the ocelli; clypeus transversely oval, the anterior margin broadly rounded, the surface convex and hairy; antennal fossae confluent, with a mere suggestion of a carina between them; antenna shown in plate V, fig. 31.

On the pleural pieces of the pronotum the streptaulus well-marked, turning upward and becoming obsolete before reaching the level of the spiracular tubercles; the pronotum long, considerably arched in profile; the metapostnotum sunken and in the very middle concealed. Propodeum long and low, with a short, somewhat oblique, emarginate, posterior face, the postero-lateral edges rather prominent, its surface smooth, the posterior surface weakly finely striate.

Apex of abdomen compressed, the apex of sternite 6 narrowly slit; last sternite (Plate III, fig. 4) narrow, pointed and with a median keel, from which the sides slope steeply, the lateral teeth situated opposite the base of this keel, far before the apex. The phallus is shown in plate III, fig. 22; the aedeagus straight and slender, of equal length with the parapenial lobes of the parameral plate, but nearly twice the length of the parameres; the latter obtusely rounded at apex, with some apical setae but not spinose on the ventral surface, the parapenial lobes slender, straight and parallel, close to-

gether near the median line, their tips barely incurved, compressed and blade-like and in lateral view seen to be considerably produced ventrad as a broad blade; the volsellar digitus a horizontally flattened, somewhat spatulate, broad blunt blade, its apex incurved. Length, 11.5 mm.; of forewing, 10 mm.[10]

This strictly Lower Sonoran species, within its restricted range, is one of the less infrequent species of *Psorthaspis*. I had already concluded from distribution and frequency that *tumifrons* Banks must be the male of this species when I discovered among the material belonging to the National Museum a specimen of each sex bred from a nest of the common Californian trap-door spider, which may be taken to settle the matter. This observation is also of real interest in positively demonstrating that trap-door spiders are the hosts of *Psorthaspis,* a fact which has been long suspected, but so far as I am aware not previously proven.

Distribution.—CALIFORNIA: 6♀, [Acad. Nat. Sci. Phila., 5; U. S. Nat. Mus., 1]. San Diego Co.—1♀, Poway, [Acad. Nat. Sci. Phila.]; San Diego, 1♀, June 14, (E. P. Van Duzee), [Mus. Comp. Zool.]; La Jolla, 4♀, 9♂, August 14, 1911, (J. C. Bridwell), [U. S. Nat. Mus., 3♀, 7♂; Acad. Nat. Sci. Phila., 1♂; Cornell Univ., 1♀, 1♂]. Orange Co.—Brea Hills, 1♂, July 1, 1917 and Carbon Cañon, 1♂, August 26, 1917, (E. G. Osterhoudt), [Cornell Univ.]. Los Angeles Co.—1♂, 1♀, (D. W. Coquillet), [U. S. Nat. Mus.]; Los Angeles, 2♀, 3♂, June 30, 1912, (J. C. Bridwell), [U. S. Nat. Mus., 2♂; Acad. Nat. Sci. Phila., 2♀, 1♂]; 1♀, July 13, 1926, (C. H. Hicks), [Mus. Comp. Zool.]; 1♀, 1♂, (G. E. Jenks; from nest of *Bothriocyrtum californicum*), [U. S. Nat. Mus.]; Pasadena, 1♀, [Cornell Univ.]. Riverside Co.—Palm Springs, 1♀, August 9, 1917, (E. G. Holt), [type of *bucephala,* U. S. Nat. Mus.]. Tulare Co.—Lindsay, 1♂, on *Asclepias,* (W. A. Davidson), [U. S. Nat. Mus.]; Lemon Grove, 1♀, March 1916, (E. P. Van Duzee), [Mus. Comp. Zool.]. Fresno Co.—Coalinga, 1♂, May 1–3, 1907, (J. C. Bradley), [Cornell Univ.]; Diablo Mts., near Alcalde, 1♀, August 6, 1927, (J. C. Bradley), [Cornell Univ.]. MEXICO: Baja California, (type of *aequa*).

[10] Description not drawn from types, except in part.

Psorthaspis banksi new species

♀. Entirely black; vertex, body, and legs appearing a blue violet from fine appressed tomentum; short hair on propleura and front coxae, otherwise devoid of erect hair. Wings dark, with strong violaceous reflection.

Head measurements: a 52, b 47, c 27, d 27, e 30, f 24, h 18, i 25 (lobe 21); area frontalis forming a linear bridge in plane of front and clypeus, dividing the deep antennal fossae; clypeus strongly raised, flat, heavily chitinized, its median lobe projecting far over mandibles, the apical margin shallowly emarginate, curving laterally into nearly parallel sides, the sides of its base, sloping down to the genae, showing a little lobe (as in Haupt's fig. 82) [11] absent in other species; malar space linear; eyes falling as far short of top margin of head as in *macronotum* (by a little less than twice length of pedicel); frontal fissure a finely impressed line on spatium frontale about as long as pedicel, then more deeply impressed for a little greater distance; front ocellus not in a basin, a well-marked depression on each side of and slightly behind the posterior ocelli, a fovea in center of vertex behind ocelli; posterior margin deeply concave; ocellar measurements: a 30, b 7, c 19, d 30. Antennal measurements: 15:3:10:8.

Dorsal measurements: a 30, b 41, c 19; seen from above sides of dorsal surface of pronotum are convexly rounding, the dorsal surface widest across center; lateral margins indicated only by a weak ridge or lobe posteriorly; the front part of the dorsal surface of the pronotum where it depresses a little to form the short neck, with two small tubercles in the middle, absent in other species; streptaulus sharply impressed except across median part of collar and almost to middle of side faces; a pit-like depression above and forward of spiracular tubercles. Propodeum as in *planata,* except that the corrugations extend across the hind surface, weakened medially and across the hinder part of the dorsal surface, the hind surface more concave medially, especially above, where it forms somewhat of a pocket and the ridge separating it from the dorsal surface becomes simply one of the corrugations, which also replace the radiating carinae on the apical part of the upper surface; a weak oblique ridge, overridden by the corrugations, forms a lateral border to the dorsal surface; the spiracles as in *planata,* but the surface a little more raised at the side of them. Posterior margin of under surface of front tibiae with 4 spines, the last one of which, longer, is situated in the articulatory emargination; apex with about four spinules; hind margin of metatarsus with a row of four spines and the center of under surface with a row of seven; upper surface of hind femur with a pre-apical spinule; hind tibiae with apical spines of different lengths; apical segment of tarsi with only apical spines underneath. Abdomen much more compressed than in other species, segments 3 to 6 forming a sharp median ridge. Length, 18 mm.

Holotype.—Female; Orizaba, Mexico; [Acad. Nat. Sci. Phila.].[12]

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[11] Mitt. Zool. Mus. Berlin, XVI, 1930.

[12] This specimen was indicated as a paratype of *laevifrons* by Cresson.

Species-Group 5, *portiae*

The species of this group agree with those of groups *morosa, nigriceps, planata, cressoni* and *texana* in having uniformly dark wings, although sometimes with a tendency to banding, with the first three of these groups in having a corrugated propodeum, with lateral ridges on the dorsal surface, with the groups *planata* and *cressoni* in not having the eyes reaching the top of the head and the ocelli placed low, but with the group *picta* in having long, dense, matted, and brightly colored tomentum, and the integument in part at least somewhat orange. If I am correct in assigning *australis* to this group, the males have partly grey vestiture, wings infuscated at apex, and sternite 9 (Plate III, figs. 5 and 15) has lateral teeth, a short dorsal surface and a projecting inferior horn.

Psorthaspis portiae (Rohwer)

1920. *Pedinaspis* (*Psorthaspis*) *portiae* Rohwer, Proc. U. S. Nat. Mus., LVII, p. 228. ♀. [Arizona.]
1933. *Pedinaspis portici* Banks, Psyche, XL, p. 2.

♀. Integument black, but this color entirely concealed in certain areas by long, dense tomentum, orange in color (xanthine orange to mikado orange), this tomentum on vertex, front (becoming short and sparse below, and a mere glitter on clypeus), pronotum including lateral pieces, apical one-half of tergite 2, narrowed laterally, tergites 3 to 6, sides of sternite 3, and sternites 4 to 6 almost cinereous, but that on apical tergites and on the sides of abdomen and underneath it thinner and becoming gradually paler, tomentum elsewhere black with only a dark and subdued purplish reflection. With the usual amount of short erect hair. Wings uniformly fuscous, without violaceous reflection.

Head measurements: a 58, b 57, c 35, e 38, f 24, h 17, i (middle lobe) 22; ocellar measurements: a 48, b 5, c 23, d 40. Antennal measurements: 15:3:10:10.

Eyes not reaching top of head by more than the length of the pedicel; as seen from in front the upper outline of head strongly convex at sides above eyes, nearly straight across medially, and the hind margin, from above, concave medially; ocelli very small and placed low, the hind pair distant from the hind margin by more than twice their distance apart and nearly twice that distance below a line that would connect the summits of the eyes. A weak linear depression behind posterior ocelli; front evenly rounded, beneath tomentum smooth and shining, with a short frontal fissure below; clypeus much as in *macronotum* or *banksi,* the sides, however, more oblique, connected with the front on the same plane by an interantennal ridge that is broad and flat as in *macronotum;* antennal fossae deep and widely separated; no malar space.

Dorsal measurements: a 43, b 49, c 19; pronotum with sides entirely rounded; the oblique extension of the streptaulus marked by a slight depression, but the entire surface covered and obscured by dense tomentum; the V-shaped notch at apex of mesosternum shallow, narrow, its lobes rounded. Propodeum with somewhat irregular contours, the lateral swellings being distinct, and somewhat of an elevation in front of the rather large spiracles, the dorsal surface not divided by a median fossa, but in some lights showing trace of a median suture, smooth and velvety except for two or three rugae at apex and corners; posterior face coarsely transversely rugose, the rugae sometimes obsolete in center, but extending on to the posterior part of the lateral faces. Last segment of hind tarsi with only apical spines underneath. Length, 18 mm.

The specimen described above, the female from Santa Catalina Mts., was compared with the type by Banks. The measurements were taken from another specimen.

Distribution.—ARIZONA: Pima Co.—Santa Catalina Mts., 1 ♀, September 10, 1924, alt. 23,000 ft., (A. A. Nichol), [Mus Comp. Zool.]; Sabinal Basin, 1 ♀, September 17, 1918, (C. H. T. Townsend), [*holotype,* U. S. Nat. Mus.]. Cochise Co.—Douglas, 2 ♀, August 7 and September 11, 1933, (W. W. Jones), [U. S. Nat. Mus.]. TEXAS, 1 ♀, [Acad. Nat. Sci. Phila.].

Variants.—A female from Texas in the Academy of Natural Sciences of Philadelphia differs in having the rugae across the hind face of the propodeum obsolete medially.

A female from Hondo, Medina Co., Texas, June 3, 1909, (J. D. Mitchell), [U. S. Nat. Mus.], has the tomentum of dorsum yellow (light orange yellow) and not involving lateral pieces of pronotum.

Psorthaspis australis (Banks) new combination

(Pl. III, figs. 5, 15 and 27.)

1910. *Pedinaspis australis* Banks, Journ. N. Y. Ent. Soc., XVIII, p. 122. ♂. [Texas.]

♂. Black; the tomentum shading from dark with purplish reflection into cinereous and white; calcaria black. Wings hyaline with infuscated apex.

Face without median carina, disc of clypeus but slightly elevated, slightly convex, its base very gradually and but little depressed, forming a broad curve; anterior lobe of clypeus short, with oblique sides and convex apical margin; vertex rounded; ocellar measurements: a 12, b 5, c 22, d 11.

Front claws asymmetrical, but not very strongly so, the anterior claw a little more curved, its tooth a little wider and more lobe-like; longer hind tibial spur three-quarters as long as metatarsus.

Sternite 9 with strong lateral teeth, the smooth and glabrous dorsal surface not projecting medially much beyond them (Plate II, fig. 5) so that it forms a three-sided figure with base much greater than hypotenuse; the pubescent inferior part compressed, with a broad flat median ridge, in profile (Plate III, fig. 15) projecting caudad as a tapering horn.

The parameres in lateral view (Plate III, fig. 27) short, parallel-sided, truncate, ciliate below and apically; the volsellae from below not noticeably widened toward apex, bluntly rounded; cuspis volsellaris slender, apparently but little hooked; aedeagus moderately broad at apex. Length, 8 to 10 mm.[13]

Judging from the horn-like prolongation of sternite 9 this species would seem related to *cressoni,* and therefore more likely to be the male of *portiae* than of any other known species.

Distribution.—TEXAS: Lee Co.—Fedor, September 7, (J. Birkman), [*type,* Mus. Comp. Zool.]. Cameron Co.—Brownsville, 1 ♂, (J. C. Bridwell), [U. S. Nat. Mus.].

Psorthaspis formosa (Smith) new combination

1862. *Ferreola formosa* Smith, Journ. of Ent., I, p. 399. ♀. [Mexico: Oajaca.]

1893. *Pompilus formosus* Cameron, Biol. Centr.-Amer., Hymen., II, p. 189.

♀. Integument entirely black, but that color hidden in certain areas by dense brightly colored tomentum, as follows: orange (orange-rufous) on vertex, front (sparse below and easily rubbed off), occiput, upper part of temples, entire pronotum, mesonotum, dorsal and upper lateral parts of tergites 3 and 4, dense but short and ash-gray on under parts except sternites 5 and 6, most of pleura and legs, apical two-thirds of propodeum except posterior face, dorsal and lateral surfaces of 1st tergite, sides extending onto dorsum at base of tergite 2, sides of tergites 3 and 4; the following black: band between wings and involving upper part of pleura, apex of propodeum, base of tergite 1, most of tergite 2, and abdominal segments 5 and 6. The usual amount of erect hair present, but assuming the color of the tomentum of the areas on which it occurs. Fore wings vaguely banded, the color due largely to the color of the rather long and dense hair, in general blackish, with a vague paler band before apex of median and submedian cells, an opaque dirty white band covered with long matted tomentum crossing wing just before stigma, and the apex subhyaline; hind wings nearly hyaline, the apex and outer margin infumated.

Head measurements: a 47, b 49, c 30, e 33, f 21, h 15, i (median lobe) 19; profile of head convex, the lower part of front straight, the area frontalis forming a broad, flat-topped bridge between the front and the disc of the clypus on the same level as each; the latter a projecting plate, slightly depressed apically; frontal fissure reduced to a puncture; ocelli placed below

[13] Description drawn from what is presumed to be a paratype.

level of tops of eyes; a slight depression latero-caudad of ocelli; eyes not reaching close to hind margin of head; this seen from in front arched above eyes and nearly straight across the center, from above concave; ocellar measurements: a 33, b 6, c 23, d 33. Antennal measurements: 13:3:9:8.

Dorsal measurements: a 34, b 42, c 15; lateral margins of pronotum rounding into side-pieces, a little convex; humeri not prominent; streptaulus concealed by tomentum, a fossa in front of spiracular tubercles; mesosternal laminae short, acute, a shallow curved emargination between them. Dorsal surface of propodeum densely covered by tomentum, corrugated at apex and weakly at sides, with weak lateral ridges, with a weak median groove; posterior flattened face outlined above by a semicircular ridge, its sides and the posterior part of the lateral faces corrugated. Front tibiae with three spines underneath, only spinules at apex; hind femora devoid of preapical spinules; ultimate segment of tarsi with only apical spines underneath. Length, 16 mm.

Distribution.—Mexico: 1 ♀, [U. S. Nat. Mus.]; Oajaca, [*type*[14] in British Museum].

Variant.—One female, Mexico, [U. S. Nat. Mus.]. Propodeum, pleura, first tergite and sides of others (except a small spot on second) devoid of cinereous pubescence and hair sparse on legs beyond coxae; banding of wings obscure.

Species-Group 6, *cressoni*

This group contains only one species; it agrees with groups *morosa* and *planata* in having all black integument covered with minute tomentum giving a purplish sheen and dark violaceous wings, and it agrees with groups *planatus* and *portiae* in not having the eyes reaching the top of the head nor the ocelli placed low; but it differs from these and agrees with group *texana* in having a smooth propodeum with even contour and no striae.

The males have tomentum purplish and wings black, like the females. The ninth sternite is of the type of the males that I have associated with the preceding group, *portiae*.

Psorthaspis cressoni new species
(Pl. III, figs. 6, 16 and 28; pl. IV, figs. 24 and 25.)

1872. *Parapompilus laevifrons* Cresson, Trans. Amer. Ent. Soc., IV, p. 206. ♀. Misidentification of his *Ferreola laevifrons*.
1911. *Pedinaspis* (*Psorthaspis*) *laevifrons* Banks, Jour. N. Y. Ent. Soc., XIX, p. 231. Misidentification.

[14] I have not seen the type of this species.

♀. Integument black; fine oppressed tomentum giving the head, body and legs a much duller, more subdued purple than the brilliant violet of *laevifrons;* erect hair under head, on propleura, front coxae and last segment of abdomen. Wings dark, with a dull violaceous reflection.

Head measurements: a 62, b 56, c 40, d 33, e 39, f 27, h 13, i 30 (lobe 25); area frontalis forming a narrow flat bridge between front and clypeus in same plane as each; clypeus flat, strongly projecting, elevated above mandibles, its sides nearly parallel, rounding into the slightly convex anterior margin, at base making a small angle at inner condyle of mandibles; eyes not swollen, nearly straight, parallel above, convergent below, not attaining top of head (Plate IV, fig. 24), frontal fissure faintly impressed, short; front densely covered with very minute punctulation and numerous, sparse, very small, shallow, punctures; vertex without strong depressions, yet its surface slightly irregular; upper margin as seen from in front broadly convex, weakly marginal posteriorly; ocellar measurements: a 17, b 2, c 8, d 13. Antennal measurements: 16:3:8:10.

Dorsal measurements: a 50, b 55, c 28; lateral margins of dorsal surface of pronotum parallel, margined by pronounced rounding ridges; humeri prominent; streptaulus pronounced only at shoulders or a little behind and mesad; an oblique, linear depression in front of spiracular tubercles, reaching hind margin; mesosternal laminae widely separated, the hind margin connecting then forming a wide shallow arcuate emargination. Propodeum with smooth surface and even contour, posterior surface oblique and medially concave, rounding into dorsal surface, with weak dorsal median furrow, its spiracles elongate, straight, not surrounded by tubercles. Length, 21 mm.

♂. Coloration, wings and vestiture like ♀.

Seen from in front outline of vertex (Plate IV, fig. 25) is curved upwards at sides above the eyes, forming a break with their outline, then connected nearly straight across; base of clypeus rather abruptly and strongly depressed, the sides of the basal margin converging obliquely upwards toward the center of face, the disc nearly flat; length of anterior part of clypeus (cephalad of a lateral notch above inner condyles of mandibles) about one-half as long as its width; ocellar formula: a 27, b 6, c 26, d 28. Front claws scarcely asymmetrical.

Sternite 9 (Plate III, figs. 6 and 16) very much as described for *vicina,* differing in detail as figured. Parameres (Plate III, fig. 28) not flattened, in lateral view with an enlarged and bluntly pointed head, with bristly inferior margin and ciliate at apex; volsellae twisted, and from ventral view with a pointed head deflected obliquely mesad; cuspis volsellaris broad, appearing obliquely truncate, pointed at anterior apico-lateral angle; aedeagus slender, notched at tip. Length, 14 mm.

Holotype.—Female; Bosque Co., Texas; (Belfrage); [Acad. Nat. Sci. Phila.].

Allotype.—Male; same data as for type; [Acad. Nat. Sci. Phila.].

Paratypes.—8 ♀, 6 ♂, same data as for type, [Acad. Nat. Sci. Phila., 4 ♀, U. S. Nat. Mus., 3 ♀, 4 ♂, Cornell Univ., 1 ♀, 2 ♂]. 6 ♀, Texas, [Acad. Nat. Sci. Phila., 3; Mus. Comp. Zool., 2; Cornell Univ., 1]. 1 ♀, Katherine, Texas, August 6, 1906, (J. D. Mitchell), [U. S. Nat. Mus.]. 1 ♀, Lee Co., Texas, (F. Birkmann), [Mus. Comp. Zool.]. Llano, Llano Co., Texas, 1 ♂, October 25, 1905, (A. W. Morrill), [U. S. Nat. Mus.]. 1 ♀, Austen, Travis Co., Texas, October 1899, (C. T. Brues), [Mus. Comp. Zool.]. 1 ♀, Mercedes, Hidalgo Co., Texas, January 1909, (T. D. Urbahns), [U. S. Nat. Mus.].

So far as records show this species has been collected only in a strip of Austroriparian central Texas from north of the center to the Mexican border.

Species-Group 7, *vicina*

This group consists of only one species which differs from all others in having a transverse clypeus (Plate IV, fig. 26) with only a slightly elevated but convex disc that is not produced basad in a narrowing median lobe, as in other species, and with its anterior margin broadly rounded from side to side. It agrees with several of the preceding groups in having all black integument and dark wings, with groups *cressoni* and *texana* in having a smooth propodeum, and with *morosa* and other groups in having the eyes reaching well up onto the vertex.

The shape of the clypeus of the ♂ corresponds to that of the ♀, but the 9th sternite (Plate III, figs. 7 and 17) is of the type found in groups *cressoni* and presumably *portiae*. Vestiture and wing color corresponds with the female.

Psorthaspis vicina (Cresson) new combination
(Pl. III, figs. 7, 17 and 29; pl. IV, figs. 26, 27 and 28.)

1872. *Parapompilus vicinus* Cresson, Trans. Amer. Ent. Soc., IV, p. 206. ♀. [Texas.]
1897. *Pompilus bombinator* Dalle Torre, Catal. Hymen., VIII, p. 277.
1897. *Pompilus* (*Pedinaspis*) *vicinus* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*Pedinaspis*) *vicinus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♀. Integument black or brownish black, with dull violaceous reflections due to minute tomentum; clypeus, front, vertex and pronotum with moderately abundant, short, erect dark hair, also present but sparser on head be-

neath, propleura, front coxae, abdomen beneath and above where it is denser apically. Wings fuscous with dull violaceous reflection.

Head measurements: a 44, b 44, c 26, d 26, e 28, f 25, h 11, i 26; profile of front rounding, the ocelli and tops of eyes on upper surface; eyes (Plate IV, fig. 26) barely inflated, nearly reaching mandibles but leaving a linear malar space that is no wider in front than at the posterior condyle of the mandibles, inner margins of the eyes barely concave, nearly parallel; antennal fossae weakly depressed; area frontalis sloping, not forming a distinct median ridge, and depressed below level of front and of clypeus; latter with the sides of its base a little oblique and somewhat depressed, much less than in other species, its surface slightly convex, the sides of its median lobe with a minute basal notch at the inner condyle of the mandibles, forming with the anterior margin an unbroken arc; mandibles as in other species; frontal fissure a finely impressed faint groove, beginning at the level of the upper margin of the antennal sockets and extending one-half of way to front ocellus; latter in a depression; hind ocelli a little tilted, and with a depression laterad of each; hind margin of head seen from in front rounded, from above straight; ocellar measurements: a 30, b 6, c 25, d 27; antennal measurements: 14:3:10:10.

Dorsal measurements: a 28, b 38, c 22; side margins of dorsal surface of pronotum nearly straight and parallel, strongly rounding in anteriorly; lateral margins indicated by a rounding ridge, about equally pronounced throughout; streptaulus deeply impressed at humeri, sides of collar and on anterior part of lateral pieces of pronotum; an oblique furrow in front of spiracular tubercle; laminae of mesosternum separated by a shallow, acute notch. Propodeum very much as in *P. texanus,* with even contours and no striae, the posterior surface a little sloping, concave, the spiracles large, nearly straight, without tubercles. Abdomen slightly compressed at tip. Length, 16 mm.

♂. Coloration and vestiture like the female.

Seen from in front (Plate IV, fig. 27) the outline of the vertex forms with the outer orbits an unbroken curve; base of clypeus slightly depressed, the upper margin forming a broad low arc, a line connecting the lateral notches of clypeus (above the inner condyles of the mandibles) would cut off an anterior semi-ellipse, the length of which is less than one-third the diameter; ocellar measurements: a 10, b 5, c 22, d 19. Front claws strongly asymmetrical (Plate IV, fig. 28).

Sternite 9 with its smooth and glabrous dorsal surface (Plate III, fig. 7) produced as a tooth on each side, from which its margins are oblique to the pointed apex, forming a lobe broader than long; the inferior horn with weakly hairy surface, projecting as a slender pointed lobe far beyond, in profile (Plate III, fig. 17) projecting downward and caudad as a thick horn, tapering to the blunt tip.

The parameres (Plate III, fig. 29) flattened, strap-like, in lateral view parallel-sided and obliquely truncate at apex, ciliate on inferior margin; the volsellae flattened, slightly twisted, the apex scarcely broadened and bluntly

rounded; the cuspis volsellaris unciform; the aedeagus a parallel-sided, bluntly tipped strap. Length, 9 to 10 mm.

This species is readily recognized by its different facial and clypeal conformation.

Distribution.—TEXAS: Bosque Co., 7♀, 2♂, (Belfrage), [♀ *lectotype,* 2♀ *paratypes,* Acad. Nat. Sci. Phila.]; 1♀, 2♂, [1♀, U. S. Nat. Mus.; 1♂ *allotype,* 1♀, Cornell Univ.]. Lee Co.—Fedor, 2♀, May 31, 1899, June, (G. Birkman), [Mus. Comp. Zool.].

Species-Group 8, *texana*

This group agrees with all that precede in having uniformly dark wings; it agrees with all groups except *planata, portiae* and *cressoni* in having the eyes reaching the summit of the head and the ocelli placed near the hind margin; it agrees with group *cressoni* in having a propodeum with smooth contours, devoid of striae or nearly so, but it agrees with groups *nigriceps, portiae* and those that follow in having some considerable portion of the integument orange in color.

The males have wings clear or infuscated at apex, and griseous vestiture; 9th sternite (Plate III, figs. 8, 9, 18 and 19) slender, with or without lateral teeth, liguliform, keeled beneath, in profile slender, curved below and tapered to apex.

Psorthaspis brimleyi (Malloch) new combination

1928. *Pedinaspis brimleyi* Malloch, Proc. Ent. Soc. Wash., xxx, p. 101. ♀. [North Carolina.]

♀. Integument black, except a double orange (orange-buff) spot, fused medially and occupying all of 2nd tergite except apical and lateral margins; tomentum short, velvety, black with a dull purplish lustre, except on orange spots where it is concolorous and silky; with the usual amount of short hair. Wings deeply infuscated, without violaceous reflection.

Head measurements: a 65, b 63, c 37, d 36, e 41, f 28, h 16, i (disc) 25; profile of front flat below; frontal fissure reduced to one or two punctures; area frontalis forming a brief narrow carina between the flat spatium frontale which narrows downward to it, and the flat disc of clypeus, all three being at the same level; sides of clypeal lobe convergent, the anterior margin rounded, the apical part of disc deflected slightly toward the mandibles, which are unusually broad and heavy: a short mandibular space; eyes falling short of top of head by about one-half the length of the scape; ocelli

below level of tops of eyes; posterior margin of head, seen from in front, curved at sides above eyes, nearly straight across center, from above concave; a week median impression behind the ocelli; and a more pronounced basin to the side of and somewhat above each lateral ocellus; ocellar measurements: a 50, b 6, c 29, d 42; antennal measurements: 19:4:14:13.

Dorsal measurements: a 48, b 62, c 30; center of collar on level of dorsum; lateral margins of dorsal surface of pronotum marked by weak rounding ridges, curved and convergent anteriorly, the humeri not prominent; streptaulus present on anterior half of side-pieces of pronotum, only slightly divergent from lower margin; an oblique groove forward of spiracular tubercle; laminae of mesosternum small, acute, separated by a shallow emargination, depressed medially. Propodeum with a smooth velvety surface and rather even contours, the posterior face oblique, medially slightly concave, the dorsal surface not rounding onto the lateral as in *cressoni*, especially behind where the postero-lateral corners are more prominent although rounded and not angular; dorsal surface without a median furrow, the spiracles with a low tubercle in front. Two or three spines on hind margin of front tibiae underneath before the articulatory notch, one at the base of the latter and two or three short, stouter spines on apical part and margin of notch, some spinules at apex of tibiae; only apical spines underneath ultimate segment of tarsi. Length, 19 mm.

Distribution.—NORTH CAROLINA: Wake Co.—Raleigh, (*holotype,* ♀), [U. S. Nat. Mus.]; 2 ♀, 21 August 1927 and 15 August 1925, (C. S. Brimley), [Mus. Comp. Zool.]; Cary, [rec. by Brimley]. Carteret Co.—Beaufort, [rec. by Brimley]. Rockingham Co.—Mayodan, 1 ♀, September 13, 1921, (J. C. Bradley), [Cornell Univ.]. McDowell Co.—Marion, [rec. by Brimley]. TEXAS: Dallas, 1 ♀, [Mus. Comp. Zool.].

Psorthaspis texana (Cresson) new combination

1872. *Parapompilus texanus* Cresson, Trans. Amer. Ent. Soc., IV, p. 206. ♀. [Texas.]
1897. *Pompilus* (*Pedinaspis*) *texanus* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*P.*) *texanus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♀. Integument black or brownish, except abdominal segments 2 to 6 orange; with a strong velvety brown lustre, on propodeum and 1st tergite silky brown, on rest of abdomen silky orange, becoming paler apically, all due to minute tomentum. Wings infuscated, with slight reflection.

Head measurements: a 47, b 51, c 29, d 27, e 33, f 21, h 13, i 22 (lobe 18); profile moderately curved, the ocelli and tops of eyes on the upper surface; area frontalis a very narrow ridge, bridging the front and clypeus in same plane; clypeus nearly flat, its apical part somewhat deflected toward mandibles, the sides of median lobes without a basal notch, convergent anteriorly,

the apical margin nearly straight; eyes not inflated, reaching posterior condyle of mandibles, not incurved above, the inner margins nearly parallel, slightly concave; frontal fissure barely indicated; front ocellus in a slight depression; hind ocelli a little tilted, a depression laterad of each; hind margin of head from in front straight, from above slightly concave; ocellar measurements: a 20, b 8, c 28, d 26; antennal measurements: 15:3:13:12.

Dorsal measurements: a 41, b 47, c 30; lateral margins of dorsal surface nearly straight, convergent anteriorly, the shoulders rounded, the margining ridges rounding and very weak; streptaulus well-marked on anterior third of lateral faces of pronotum, on humeri and on collar except at center; no depression in front of spiracular tubercle; laminae of mesosternum separated by a broad, shallow, acute notch. Propodeum with smooth silky surface and even contours, just a trace of cross-ridging at sides of posterior surface, and a curved linear depression above just before each postero-lateral angle, a short vertical ridge between hind and lateral surfaces; spiracles linear, the surface over them slightly raised. Posterior margin of under surface of front tibiae with two spines before the emargination, one longer and three shorter spines in the emargination; some short apical spines; hind margin of front metatarsus with a row of spines, and a median row of feebler spines beneath; only apical spines under last segment of tarsi. Abdomen not compressed. Length, 18 mm.[15]

Distribution.—TEXAS: Lee Co.—Fedor, 1 ♀, 14 May, (F. G. Birkmann), [Mus. Comp. Zool.]. Bosque Co.—3 ♀, (Belfrage), [*type* and *paratypes,* Acad. Nat. Sci. Phila.]. Blanco Co.—Cypress Mill, 1 ♀, [U. S. Nat. Mus.]. Kerr Co.—Kerrville, 1 ♀, 11 April 1907, (F. C. Pratt), [U. S. Nat. Mus.].

This species has been recorded only from a small area in Austroriparian central Texas.

Psorthaspis sanguinea (Smith) new combination

1855. *Ferreola sanguinea* Smith, Catal. Hymen. Brit. Mus., III, p. 170. ♀. [Georgia.]
1872. *Parapompilus contiguus* Cresson, Trans. Amer. Ent. Soc., IV, p. 206. ♀. *New synonymy.* [Texas.]
1897. *Pompilus sanguineus* Dalle Torre, Catal. Hymen., VIII, p. 319.
1897. *Pompilus contiguus* Dalle Torre, Catal. Hymen., VIII, p. 283.
1897. *Pompilus* (*Pedinaspis*) *sanguineus* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*P.*) *sanguineus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♀. Integument principally orange (cinnamon rufous), as follows: scape beneath, thorax except under parts, propodeum, abdominal segments 1 to 3 (but the 1st tergite dark around edges) and sometimes hind femora; head,

[15] Description drawn from the lectotype.

legs, antennae and last three abdominal segments black. Tomentum of black parts brown with silky reflection, of orange parts silky with golden reflection, of last two abdominal tergites ash-grey. With the usual amount of short erect hair, sparse on pronotum. Wings fuscous, without violaceous reflection.

Head measurements: a 41, b 45, c 26, d 24, e 29, f 22, h 11, i (disc) 16; front in profile straight below; frontal fissure a short impressed line above upper level of antennal fossae; area frontalis a narrow carina but forming a bridge at level of both front and spatium frontale, each of which is flat; clypeus a free projecting plate, but deflected towards the mandibles, the sides of its median lobe oblique, the apical margin curved; mandibular space short, none at posterior condyle; ocelli placed below level of tops of eyes; eyes almost reaching hind margin; vertex flattened laterad of each hind ocellus; hind margin of head, seen from in front, straight, from above concave; ocellar measurements: a 15, b 6, c 24, d 22; antennal measurements: 12:3:10:10.

Dorsal measurements: a 35, b 38, c 18; center of collar at level of dorsum; dorsal surface of pronotum not margined laterally, its sides almost straight, nearly parallel, the humeri curved, not prominent; streptaulus impressed on less than anterior half of side-pieces of pronotum, divergent from lower margin; no depression in front of spiracular tubercles; laminae of mesosternum adjacent medially. Propodeum like that of *texana* but still smoother, only a trace of the lateral grooves on dorsal surface (easily seen by turning so they create a shadow), no ridges behind, and only a trace of a ridge between dorsal and lateral surfaces. Front tibiae spined as in *texana*. Length, 15 to 18 mm.

I have examined Cresson's type of *contigua* in the Museum of Comparative Zoology, and find it identical with what is identified both there and in the Cresson collection as *sanguinea* Smith.[16]

Distribution.—TEXAS: Bosque Co.—1 ♀, (Belfrage), [U. S. Nat. Mus.]. Washington Co.—Hemstead, 1 ♀, April 24, 1904, (F. C. Bishopp), [U. S. Nat. Mus.]. Dallas Co.—1 ♀, [type of *contiguus,* Mus. Comp. Zool.]. KANSAS: 1 ♀, [Acad. Nat. Sci. Phila.]. ARKANSAS: Randolph Co.—1 ♀, (Byron C. Marshal), [U. S. Nat. Mus.]. FLORIDA: Orlando, 1 ♀, July 3, 1935, [U. S. Nat. Mus.]. GEORGIA: Decatur Co.—Spring Creek, 1 ♀, August 9–12, 1931, (Bradley and Knorr), [Cornell Univ.]. Berrien Co.—Tifton, 1 ♀, September 4, 1896, [Mus. Comp. Zool.]. White Co.—Indian Grave Gap, 1 ♀, September 10, 1921, alt. 3500 ft., [Cornell Univ.]. NORTH CAROLINA: Southern Pines, 1 ♀, September 24, 1908, (A. H. Manee), [Mus. Comp. Zool.]. Raleigh, August, [rec. by Brimley].

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[16] I have not seen the type of *sanguinea*.

Psorthaspis magna (Banks) new combination

(Pl. III, figs. 8, 18 and 30.)

1910. *Aporus magnus* Banks, Journ. N. Y. Ent. Soc., XVIII, p. 126. ♂. [Texas.]

1911. *Pedinaspis magnus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♂. Black, clothed with white tomentum, and some erect white hair, giving a griseous appearance; calcaria black. Wings hyaline, infuscated at apex.

Face without a median carina; clypeus scarcely elevated, nearly flat, very slightly and gradually depressed at base all the way across, not obliquely on each side; apical lobe of clypeus transverse with sloping rounded sides, the apical margin slightly emarginate; vertex without a hump; ocellar measurements: a 15, b 5, c 20. Claws of each front tarsus strongly asymmetrical; longer hind tibial spur three-quarters as long as metatarsus.

Sternite 9 slender, compressed and carinate but scarcely keeled beneath, acute at apex, without lateral teeth (Plate III, fig. 8), the dorsal surface forming a deep glabrous trough, the hairs on lateral surface (not shown in figures) unusually long. Parameres slender, nearly parallel-sided, in lateral view (Plate III, fig. 30) obtusely tapered at apex, with setae below and at apex; volsellae very much as in *conocephala;* cuspis volsellaris long and slender, unciform, aedeagus a slender rod. Length, 8.5 to 12 mm.[17]

This species probably belongs to the group *texana* and should be the male of *texana, brimleyi* or *sanguinea.*

Distribution.—TEXAS: Lee Co.—Fedor, 2 ♂, September 3, 1905, (G. Birkmann), [Mus. Comp. Zool.].

Psorthaspis conocephala new species (Pl. III, figs. 9, 19 and 31.)

♂. Integument black; tomentum rather copious and entirely white, as is also the small amount of erect hair; calcaria black. Wings entirely hyaline.

Face without a median carina; disc of clypeus slightly elevated, moderately flat, slightly depressed at base, the sides of basal depression oblique and converging above; apical lobe of clypeus short, transverse, its sides slightly oblique, the anterior margin convex; vertex with a median conical hump behind ocelli as in *planata;* ocellar measurements: a 10, b 4, c 21, d 22. Anterior claw of front tarsus shorter than the posterior, its outer ray more strongly curved, more distant from the basal ray, which is a rounded lobe; longer spur of hind tibiae two-thirds the length of the metatarsus.

Sternite 9 with small lateral teeth at base of exposed part, beyond which the smooth and glabrous dorsal surface is liguliform, acute at apex (Plate III, fig. 9), the pubescent inferior surface is compressed and medially keeled, in profile (Plate III, fig. 19) slender, gently curved below and tapered to apex. The parameres (Plate III, fig. 31) squarely truncate, with fine setae

[17] Description drawn from what is assumed to be a paratype.

below and at apex; the volsellae flattened and in inferior view a little twisted, lopsidedly spatulate, rounded at apex; cuspis volsellaris small and hooked. Length, 9 mm.

This species probably belongs to the group *texana,* and should be the male of *brimleyi, texana* or *sanguinea.*

Holotype.—Male; Brownsville, Cameron Co., Texas; (J. C. Bridwell); [U. S. Nat. Mus.].

Species-Group 9, *picta*

In this group and the following the wings are banded, a tendency foreshadowed in variants within the group *portiae.* As in that group parts of the body and usually of the wings are obscured by long dense tomentum, and the integument is often variegated; the eyes reach the top of the head and the ocelli are placed close to the hind margin of the head; the propodeum is coarsely corrugated.

The males are not certainly known, but probably have white vestiture and hyaline wings with fuscous apices as in *alternata* which probably belongs in this group.

Psorthaspis picta (Kohl) new combination

1869. *Ferreola formosa* Cresson, Proc. Bost. Soc. Nat. Hist., XII, p. 376. ♀. [Mexico: Orizaba.] Misidentification.
1886. *Pompilus pictus* Kohl, Verh. K. K. Zool.-Bot. Gesellsch. Wien., XXXVI, p. 338. ♀. [Mexico: Cuernavaca.]
1911. *Pedinaspis picta* Schulz, Zool. Annalen, IV, p. 120.

♀. Integument black, tergite 3 largely orange (capucine to salmon orange), two spots, fused medially extending almost to the apical margin, but not to the extreme sides; pubescence of following black: anterior half or less of pronotum, scutellum, postscutellum, posterior margin of upper plate of mesopleura and entire upper plate of metapleura, broad basal border of propodeum and its posterior face, vertical face of tergite 1, tergites 2 and 4 except ventral surface of sides; the following ash-grey (pallid neutral grey), exceedingly dense: lower and hinder parts of head, entire ventral surface and legs, mesopleura (except hind border of upper plate), lower plate of metapleura, more than apical half of dorsal and lateral faces of propodeum, dorsal surface of 1st tergite, and entire tergites 5 and 6, these touched with yellowish medially; the following yellow (yellow ochre): upper part of head, increasing in intensity toward vertex, posterior half (medially) to three-quarters (laterally) of dorsal surface of pronotum and its entire lateral faces, and the mesonotum, this tomentum and the grey tomentum on hind upper part of propodeum long and matted; calcaria black, but covered with grey pubes-

cence. Wings banded, infuscated, without reflection, the following parts pale: a band from beyond apex of marginal cell to outer margin (again a little infuscated at tip of wing), a band crossing middle of 1st submarginal cell and extending to tip of anal cell, a partial cross-band occupying middle of median and costal cells, these latter two bands whitened by whitish tomentum.

Head measurements: a 46, b 51, c 26, d 25.5, e 32, f 23, h 13, i 22; the area frontalis forms a moderately broad strip connecting the front and the clypeus in the same plane; clypeus moderately flattened, its sides converging anteriorly, its front margin rounded, the labrum concealed; frontal fissure represented by a pit above spatium frontale and a depression above it; eyes reaching top of head, separated from hind margin by about one-half the length of the pedicel; no obvious depressions on vertex; hind margin of head truncate, shallowly emarginate medially; ocellar measurements: a 25, b 7, c 19, d 27; antennal measurements: 15:4:10:9.

Dorsal measurements: a 32, b 48, c 20; lateral margins of dorsal surface of pronotum scarcely indicated; streptaulus present, paralleling anterior margin of lateral faces of pronotum; a slight depression in front of spiracular tubercles; apical median notch of mesosternum broad, V-shaped; propodeum shaped as in *purpuripennis,* with lateral ridges overridden by corrugations, but without a median dorsal furrow, and with a ∩-shaped ridge margining the posterior face on which the corrugations are weak, especially medially. Four spines underneath posterior margin of front tibiae, spinules at apex, a row of 5 spines along posterior side of metatarsus, shorter than width of segment; no spines under last segment of tarsi; longer hind tibial spur five-elevenths length of metatarsus. Length, 8 mm.[18]

Described from the specimen from Orizaba incorrectly recorded by Cresson as *formosa* Sm.

Distribution.—Mexico: Morelos.—Cuernavaca. Vera Cruz.—Orizaba, 1 ♀, [Acad. Nat. Sci. Phila.].

Psorthaspis alternata (Banks) new combination

1931. *Pedinaspis alternata* Banks, Bull. Brooklyn Ent. Soc., xxvi, p. 132. ♂. [Mexico: Yucatan.]

♂. Black, with much gray hair, the base of tergite 1, basal half of 2, and tergites 3 to 6 densely white pilose. Wings hyaline, infuscate toward apex.

Anterior margin of clypeus almost truncate; lateral ocelli about equidistant from eyes and one another; vertex between and behind posterior ocelli with a bluntly pointed hump as in *planata.* Front pair of claws asymmetrical, the anterior claw with the apical ray much farther from the inner than that of the posterior claw, the inner ray a bluntly rounded lobe; the posterior claw of the front pair is cleft, the inner ray close to the outer and

[18] I have not seen the type.

parallel, truncate at tip, similar to claws of middle and hind legs; longer hind tibial spur longer than one-half the metatarsus. Length, 10 mm.

The species is likely to be the male of *picta* or of some related species; yet definite proof that it belongs in the group *picta* is lacking. I have not had opportunity to examine the genitalic structures.

Distribution.—MEXICO: Yucatan.—Chichen Itza, 1 ♂, June 29, (J. Bequaert), [*holotype,* Mus. Comp. Zool.].

Psorthaspis bioculata new species

♀. Integument black, except two large round spots on tergite 2, entire 4 and base of 5, yellow (apricot yellow, in paratype orange buff) tomentum of vertex, upper part of temples, and pronotum, including upper half of side-pieces yellow (light cadmium) silky, that on pronotum dense (the tomentum of front and clypeus of type rubbed off); tomentum black and velvety on mesonotum, and middle lobe of scutellum and postscutellum; tomentum of under parts, legs, most of pleura, sides of scutellum and postscutellum, and propodeum silvery-sericeous, with a faintly golden tinge; tomentum of abdomen so short that the integument appears bare. With the usual scanty, short, erect hair. Wings hyaline, the fore wings with two fuscous cross-bands connected by a bar, the inner one occupying the apex of median, submedian and anal cells, the base of the 1st submarginal, and the entire first and second discoidal cells; the second occupying the entire marginal cell and extending equally broadly across the wing behind it; hind wings hyaline, also with an irregular median lightly infuscate band connected by a bar with the infuscate apex.

Head measurements: a 49, b 52, c 26, d 27, e 31, f 25, h 13, i (disc) 17; frontal fissure a faintly impressed line on lower half of front, beginning at level of upper margin of antennal sockets; area frontalis forming a narrow rounding ridge, connecting spatium frontale with disc of clypeus and at the same level as each, the latter flat, not depressed apically, its lateral margins oblique, rounding, the apical margin truncate; malar space short, absent at posterior condyle; eyes reaching onto top of head, nearly to hind margin, the ocelli located well below their summit; front ocellus in a depression, vertex raised medially, depressed laterad of the hind ocelli; hind margin of head from in front convex, prominent medially, from above nearly truncate; ocellar measurements: a 32, b 8, c 23, d 22; antennal measurements: 13:4:8:8.

Dorsal measurements: a 30, b 43, c 22; level of dorsum just below top of vertex, but anteriorly terminated medially by a low vertical surface, the collar being depressed to a lower level, from a front view this surface broadly triangular, glabrous and smooth; dorsal surface of pronotum not margined laterally; streptaulus, if present, hidden by tomentum; no depression in front of spiracular tubercles; apical laminae of mesosternum small, rounded, with

a small acute notch between them. Dorsal surface of propodeum without median furrow, covered with not dense, short, decumbent, white pubescence, the lateral ridges distinct but not strongly developed, somewhat accentuating the postero-lateral corners, the surface otherwise smooth except for a few sharp apical carinae which extend on to the lateral faces; no tubercle in front of the spiracles; junction of upper and posterior faces a little prominent medially; posterior surface depressed medially, transversely carinate, the carina crowded together above in the middle, and becoming obsolete below, carrying over onto the lateral faces where they immediately weaken and disappear. Only two spines under front tibiae, the longer one being at bottom of the articulatory notch; apical spinules reduced; only two small spines on side of front metatarsus; one preapical spinule on hind femora; the last segment of hind tarsi with only apical spines underneath. Length, 11 to 14 mm.

The small smooth surface of the pronotum perpendicular to the dorsal surface and the collar, and interposed between the two, serves to distinguish this species from all others.

Holotype.—Female; Costa Rica; [U. S. Nat. Mus.].

Paratype.—1 ♀, Rosario Mine, Honduras, April 5, (Marston Bates), [Mus. Comp. Zool.].

Psorthaspis canipennis new species

♀. Integument black, except for a transverse ivory (cream color) spot on each side of base of tergite 3, and the pedicel, apex of scape beneath and base of segment 3 especially beneath, which are ferruginous. Long, dense, yellow (yellow ochre) tomentum covering vertex, pronotum including sidepieces, mesonotum and base of scutellum, the same but sparse and short on front and even on clypeus; tomentum shorter and black on remainder of scutellum, postscutellum, base and apical face of propodeum and upper part of pleura, also, but thin, on base of tergite 1, all of tergites 2 and 4, and all except the spots of tergite 3; tomentum white on lateral surface and apex of dorsal surface of propodeum, and on apical part of 1st tergite, appearing ashen on legs, under surface, most of pleura, and last 2 tergites. Fore wings blackish, (by reason of black setae) with milky white spots and bands, made opaque by long white tomentum, a long bar in middle of median cell, a transverse band occupying all but extreme base and apex of 1st submarginal cell and extending across wing, and the wing apex; hind wings clear basally, clouded on lower margin and apex.

Head measurements: a 37, b 42, c 22, d 19, e 26, f 18, h 11, i (disc) 13; frontal fissure faintly impressed, above upper level of antennal fossae; area frontalis forming a narrow carina joining clypeus to front approximately at the level of each; disc of clypeus a free plate but somewhat deflected apically, its lateral and apical margins forming a half-oval, flattened apically; malar space short, absent at posterior condyle; eyes reaching top of head and al-

most to hind margin, the ocelli anterior to their tops; depressions of vertex slight; hind margin, seen from in front, slightly concave, from above concave; ocellar measurements: a 18, b 6, c 18, d 22; antennal measurements: 12:3:8:8.

Dorsal measurements: a 27, b 34, c 17; profile of dorsum more curving than usual, continuous with collar in center; sides of dorsal surface of pronotum not margined, slightly convergent, the humeri not prominent; streptaulus distinct, paralleling lower margin almost to center of lateral pieces of pronotum; a faint impression in front of spiracular tubercles; mesosternal laminae acute, with a V-shaped notch between them. Dorsal surface of propodeum rather even, without a median furrow, with weak lateral ridges, an oblique furrow indicated mesad of each; spiracles straight, without a tubercle in front; a carina marks top of posterior face which is flat, smooth in middle, wrinkled at sides; posterior part of lateral faces corrugated. Spines of forelegs as in *bioculata;* hind femora with several spinules on upper surface; ultimate segment of tarsi with only apical spines, or with one or two others, not paired. Length, 11 mm.

Holotype.—Female; Alajuela, Canal Zone, Panama; May 28, 1912; (A. Busck); [U. S. Nat. Mus.].

Psorthaspis impudica (Cameron) new combination *

1893. *Pompilus impudicus* Cameron, Biol. Centr.-Amer., Hymen., II, p. 187, ♀. [Panama.]
1911. *Pedinaspis impudica* Schulz, Zool. Annalen, IV, p. 119.

♀. Black, apex of tergite 3 with a broad white band, narrowed in center, of 4 with narrow white band (or are these bands of white pubescence?); tomentum reddish-golden on top of head to near antennae, pronotum, mesonotum anteriorly, and base of scutellum; dense, white tomentum forming a band on base of propodeum; the apex of tergite one, and pygidium densely white pubescent; other pubescence white, the legs ashen. Wings fuscous with white bands. Length, 12 mm.

Distribution.—PANAMA: Peña Blanca.

Psorthaspis bugabensis (Cameron) new combination [19]

1893. *Pompilus bugabensis* Cameron, Biol. Centr.-Amer., Hymen., II, p. 188. ♀. [Panama.]
1911. *Pedinaspis bugabensis* Schulz, Zool. Annalen, IV, p. 119.

♀. Black; golden tomentum on vertex and pronotum; pleura and propodeum densely silvery pubescent, other pubescence white, dense on tergite 6; legs and sides of abdomen pruinose. Wings white, with two fuscous bands. Length, 12 to 14 mm.

Distribution.—PANAMA: Bugaba.

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* I have not seen this species.
[19] This species is unknown to me.

Psorthaspis variegata (Smith) new combination

1862. *Ferreola variegata* Smith, Journ. of Ent., L, p. 378. [Mexico.]
1893. *Pompilus variegatus* Cameron, Biol. Centr.-Amer. Hymen., II, p. 110.

♀. Black, except 3d tergite pale dull ferruginous. Tomentum black except as follows: that on propodeum dorsally and laterally and first tergite silvery white, that on coxae, femora and abdomen beneath thin, ashy. Wings subhyaline, the base of the fore wings, a fascia at middle, and a second and broader one crossing at marginal cell, dark fuscous. Length, 10.5 mm.

Distribution.—MEXICO.[20]

Psorthaspis naomi (Smith) new combination [21]

1855. *Parapompilus naomi* Smith, Catal. Hymen. Brit. Mus., III, p. 177. ♀. [Santo Domingo.]

♀. Integument black; tomentum black, short and velvety with purple sheen on front legs, pro- and mesothorax, tergite 2, and two oblique stripes on 3, these meeting about the middle of the segment; head, legs, propodeum and other parts of thorax and abdomen covered with dense, very short, white pubescence. Fore wings hyaline, with a broad, dark fuscous cloud crossing from marginal cell, its width equalling the length of that cell.

A longitudinal wavy carina extending from base to apex of each side of dorsal surface of propodeum. Length, 8 to 12 mm.

Distribution.—SANTA DOMINGO.

Species-Group 10, *mariae*

This group represents the culmination of modification within the genus; the integument of the females is in large part to even wholly reddish ferruginous, the wings banded, the propodeum finely striate posteriorly, but with even contour, the spatium frontale narrow and depressed, the eyes reaching the top of the head and the ocelli close to the hind margin, the vestiture short, usually colored to correspond to the underlying integument, to which it gives a silky lustre. The ninth sternite of the males, of which two species are here made known (Plate III, figs. 10, 11, 20, and 21), has small lateral teeth, no lobe or horn projecting beyond the apex of the smooth and glabrous dorsal surface, and in profile is convex below.

[20] I have not seen this species, the type of which should be in the British Museum.
[21] I have not seen this species.

Psorthaspis elegans (Cresson) new combination [22]

1865. *Pompilus elegans* Cresson, Proc. Ent. Soc. Phila., IV, p. 126. ♀. [Cuba.]
1867. *Pompilus elegans* Cresson, Trans. Amer. Ent. Soc., I, p. 109. ♀.
1911. *Pedinaspis elegans* Schulz, Zool. Annalen, IV, p. 119.

"Ferruginous; head, antennae, legs and broad band near base of abdomen, blackish; metathorax, legs and base of apex (*i.e.* base and apex) of abdomen, densely covered with cinereous pile; wings whitish-hyaline, with a very large fuliginous spot near the tip, as well as a small spot at base and middle." Length, 10.5 mm.

Distribution.—CUBA: [♀ type, Gundlach Coll., Havana].

Psorthaspis mariae (Cresson) new combination
(Pl. III, figs. 10, 21, 23 and 32.)

1867. *Pompilus? mariae* Cresson, Trans. Amer. Ent. Soc., I, p. 108. ♀. [Pennsylvania.]
1897. *Pompilus* (*Pedinaspis*) *mariae* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*P.*) *mariae* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.
1921. *Pedinaspis mariae* var. *antennalis* Banks, Ann. Ent. Soc. Amer., XIV, p. 21. ♀. [Virginia.]

♀. Orange: scape and pedicel beneath, thorax except mesosternum, propodeum, abdominal segments 1 to 3, hind femora (except base beneath), and much of hind tibiae underneath and laterally yellow; two large, partly fused basal spots on tergites 2 and 3; reddish brown: scape above, spot on disc of clypeus, and mandibles; black: head, flagellum, mesosternum, most of legs, last three abdominal segments; tomentum minute and thin, of the color of the underlying integument, which it does not conceal. Some short, erect, hair on head, propleura and abdomen. Fore wings weakly fasciate, moderately infuscated, with a vaguely defined clearer band crossing from 1st submarginal cell to base of 3d discoidal, and an elongate hyaline bar occupying center of median cell; hind wings clear, lightly infuscated apically.

Head measurements: a 40, b 45, c 24, d 22, e 28, f 22, h 10, i (lobe) 16; profile convex, the ocelli and top of eyes on the upper surface; antennal sockets well separated, so that the area frontalis is rather wide between them, but not flat; area frontalis forming a very narrow acute ridge, depressed below level of front or clypeus, yet distinctly separating the antennal fossae; disc of clypeus elevated, its base strongly but not abruptly depressed on each side, oblique but not as much so as in some species, its surface nearly flat, deflected somewhat but not fitting closely above the mandibles; sides of median lobe with a very small basal notch, oblique and converging, rounding into the slightly convex apical margin; eyes reaching posterior condyle of mandibles, bare, slightly inflated; frontal fissure a finely impressed line oc-

[22] I have not seen this species.

cupying about median third of front; front ocellus in a slight depression; vertex flattened laterad of each hind ocellus; posterior margin of head truncate as seen from in front, slightly concave from above; ocellar measurements: a 14, b 8, c 23, d 23; antennal measurements: 12:3:9:10.

Dorsal measurements: a 32, b 39, c 16; sides of dorsal surface of pronotum convergent anteriorly, not margined laterally; humeri rounded; streptaulus impressed at sides of collar, humeri, and on front third of lateral pieces of pronotum; a V-shaped notch between apical laminae of mesosternum. Propodeum a little expanded posteriorly by weak rounding lateral ridges, posterior and lateral faces separated by a vertical carina, the former crossed above and laterally by fine carinae; dorsal surface smooth, with a weak median line, small tubercles in front of the spiracles. Posterior margin of under surface of front tibiae with 2 spines before the articulatory notch, and a longer one at its base, apex with a few short spines, a few spines along sides of front metatarsus; outer ray of middle claw strongly curved, parallel to inner tooth, both acute (other claws lacking in type). Abdomen not much compressed. Length, 12 to 16 mm.[23]

♂. Integument black; tomentum and pubescence nearly all white, conspicuous, giving the insect a griseous tone, but dark on mesonotum, scutellum and disc of propodeum. Calcaria black. Wings hyaline, fuscous towards apex.

Face without median carina; clypeus nearly flat, but little elevated, depressed basally, the non-depressed area produced upwards a little in middle, apical lobe short, transverse, and broadly rounded; vertex behind ocelli roundly elevated, but without a conical hump; ocellar measurements: a 12, b 7, c 21, d 18. Front claws scarcely asymmetrical; longer spur of hind tibia three-quarters as long as metatarsus.

Sternite 9 with two lateral teeth (Plate III, fig. 10) beyond which the smooth and glabrous dorsal surface is liguliform; the pubescent inferior part strongly keeled medially below, in profile (Plate III, fig. 21) short and strongly arcuate. The parameres in lateral view (Plate III, fig. 32) parallel-sided, squarely truncate, with fine setae on inferior and apical margins; volsellae flattened and a little twisted, from below (Plate III, fig. 23) with somewhat of an expanded head, projecting mesad, but not pointed; cuspis volsellaris unciform; aedeagus a slender rod, slightly thickened dorso-ventrally at apex. Length, 12 mm.

There is a possibility that the male here described belongs to *sanguinea* instead of *mariae*.

Distribution.—FLORIDA: ♀. Orange Co., 1 ♂, August 10, 1927, (M. M. Smith), [*allotype,* U. S. Nat. Mus.]. TENNESSEE: Humphreys Co.—Hurricane Mills, 1 ♀, (G. G. Ainslie), [U. S. Nat. Mus.]. ILLINOIS: [rec. by Schulz, Mus. Univ. Geneva]. VIRGINIA: Loudoun Co., 1 ♀, August, [U. S. Nat. Mus.]. Nelson

[23] Description drawn from the type.

Co., August 12, 1927, (W. Robinson), [U. S. Nat. Mus.]. Fairfax Co.—Vienna, 1 ♀, September 22, 1912, (R. A. Cushman), [U. S. Nat. Mus.]. Falls Church, 1 ♀, (N. Banks), [Mus. Comp. Zool.]. MARYLAND: Montgomery Co.—Plummers Island, 1 ♀, August 21, 1922, (H. S. Barber), [U. S. Nat. Mus.] and 1 ♀, September 19, 1916, (R. C. Shannon), [U. S. Nat. Mus.]; Cabin John, 1 ♀, September 14, 1914, (R. C. Shannon), [Acad. Nat. Sci. Phila.]. DISTRICT OF COLUMBIA: Rock Creek, 1 ♀, 24 June 1905, (C. E. Burden), [U. S. Nat. Mus.]. NEW JERSEY: Cumberland Co., 1 ♀, September 1, 1895 and Great Notch, 1 ♀, September 8, 1901, [Acad. Nat. Sci. Phila.]. Gloucester Co.—Wenonah, 1 ♀, July 26, 1910, (C. T. Greene), [U. S. Nat. Mus.]. PENNSYLVANIA: 1 ♀, (*type,* Acad. Nat. Sci. Phila.).

Psorthaspis luctuosa (Banks) new combination

1910. *Pedinaspis luctuosa* Banks, Journ. N. Y. Ent. Soc., XVIII, p. 123. ♀. [Texas.]
1911. *Pedinaspis* (*P.*) *luctuosus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♀. Reddish yellow, abdomen black except a large pale yellow spot on each side of segment 2 and a pale basal band on 3; legs reddish yellow; abdominal segments 5 and 6 and sides of propodeum with silvery pubescence. Calcaria white. Wings as in *P. mariae.*

Eyes reaching top of head and almost to hind margin; no mandibular space at posterior condyles; as seen from in front the upper margin of the head extends straight across; distance of hind ocelli from hind margin of head scarcely over one-half their distance apart; vertex plane, without ocellar basin; clypeus as in *legata,* the interantennal ridge and front on the same plane with the clypeus, the ridge narrow, all as in *legata.* Sides of pronotum not margined; apical margin of mesosternum with broad V-shaped notch. Propodeum without a dorsal median furrow, otherwise as in *legata.* The posterior surface finely wrinkled; the spiracles as in *legata;* hind tarsi with only apical spines underneath last segment. Length, 9 mm.

Distribution.—TEXAS: Lee Co., 1 ♀, Fedor, [*type,* Mus. Comp. Zool.].

Psorthaspis legata (Cresson) new combination

(Pl. III, figs. 11, 20, 24 and 33.)

1867. *Pompilus legatus* Cresson, Trans. Amer. Ent. Soc., I, p. 109. ♀. [Georgia.]
1872. *Parapompilus legatus* Cresson, Trans. Amer. Ent. Soc., IV, p. 206. ♀.
1897. *Pompilus* (*Pedinaspis*) *legatus* Fox, Ent. News, VIII, p. 33.
1911. *Pedinaspis* (*P.*) *legatus* Banks, Journ. N. Y. Ent. Soc., XIX, p. 231.

♀. Orange, the flagellum except base, front tibiae, all tarsi and last four segments of abdomen infuscated; a basal whitish band on tergite 3, and elongate marks on sides of 4; hind and middle calcaria whitish; tomentum sparse and thin, cinereous except on dorsum where it is yellowish; a little short erect hair on head, pronotum, propleura, front coxae, and abdomen. Fore wings lightly infuscated, a broad clear band occupying submarginal cell and crossing to apex of 2nd discoidal, base of 3d, and base of 1st apical; greater part of median cell hyaline; hind wings lightly infuscated apically.

Head measurements: a 30, b 33, c 17, d 19, e 22, f 18, h 7, i 17 (lobe 14); head in profile convex, the hind ocelli on upper surface; area frontalis a small acute ridge, depressed below level of front and clypeus; disc of latter moderately elevated, more transverse than usual, its base laterally depressed but not as strongly as in most species, nor as oblique, its apical half somewhat deflected, the lateral margins of the median lobe with a scarcely appreciable basal notch, converging anteriorly, the anterior margin truncate; eyes reaching the posterior condyle of the mandibles, bare, their inner margins very slightly concave; frontal fissure an impressed line, extending from a little above upper margins of antennal sockets two-thirds of distance to front ocellus; latter in a slight depression; vertex flattened laterad of hind ocelli; hind margin of head seen from in front truncate, from above slightly concave; ocellar measurements: a 10, b 5, c 19, d 15; antennal measurements: 9:2:5:5.5.

Dorsal measurements: a 25, b 28, c 11; sides of dorsal surface of pronotum parallel, not margined, humeri rounded; streptaulus impressed on sides of collar, humeri and anterior third of lateral pieces of pronotum; a slight depression in front of spiracular tubercles; laminae of mesosternum short, far apart, separated by a shallow, arcuate emargination; legs spined as in *mariae;* outer ray of claw much less curved than in other species, being more as shown by Haupt's fig. 84d[24] for *Pedinaspis,* very divergent from inner tooth.[25]

♂. Integument black; pubescence thin, short, entirely white; calcaria white. Wings hyaline, the apex of hind wings and apical third of fore wings lightly infuscated.

No facial carina; the disc of clypeus transverse, slightly elevated, its base only a little and almost transversely depressed, its apical lobe short and broad, with the oblique lateral margins rounding into the nearly straight apical margin; ocellar measurements: a 11, b 7, c 23, d 16; vertex not elevated. Front tarsal claws symmetrical; longer hind tibial spine four-fifths as long as metatarsus.

Last sternite with two lateral teeth (Plate III, fig. 11) beyond which the smooth and glabrous dorsal surface is broadly liguliform, the pubescent inferior surface not produced beyond the dorsal apex, compressed to form a median keel, which in profile is deeply rounded (Plate III, fig. 20); the

[24] Mitt. Zool. Mus. Berlin, XVI, 1930.
[25] Description drawn from type.

largely concealed sternite 8 fits under the base of this in a tapering lobe. Parameres comparatively short, in lateral view (Plate III, fig. 33) tapering directly to an obtuse or slightly obliquely truncate apex, with a few setae below and apex ciliate; volsellae flattened, with rounded and slightly widened head (Plate III, fig. 24); cuspis volsellaris broad, hooked at apex; aedeagus slender and thickened dorso-ventrally at apex. Length, 7 to 12 mm.

Distribution.—TEXAS: Hood Co.—Cresson, 1 ♂, May 25–29, (W. G. Bruce), [U. S. Nat. Mus.]. Dallas Co., 5 ♀, (J. Boll), [Acad. Nat. Sci. Phila., 1; Mus. Comp. Zool., 4]. ALABAMA: Lee Co.—Auburn, 1 ♀, June 8–9, 1917, (Cornell U. Biol. Exped.), [Cornell Univ.]. GEORGIA: 1 ♀, [*holotype,* Acad. Nat. Sci. Phila.]. Fulton Co.—Atlanta, 1 ♂, "7–6–35," (P. W. Fattig), [*allotype,* U. S. Nat. Mus.]; Atlanta, 1 ♀, July 16, 1927, (P. W. Fattig), [U. S. Nat. Mus.]. Okefinokee Swamp, Cheshire Island, 1 ♀, July 18, 1921, [Cornell Univ.]. TENNESSEE: Montgomery Co.—Clarksville, 1 ♀, June 30, 1917, (J. J. Davis), [U. S. Nat. Mus.]. Davidson Co.—Madison, 1 ♀, (G. R. Pilate), [Mus. Comp. Zool.]. Morgan Co.—Deer Lodge, 1 ♀, June 1937, (B. Benesh). ILLINOIS. NORTH CAROLINA: Moore Co.—Southern Pines, 1 ♀, June 5, 1906, (A. H. Manee), [Mus. Comp. Zool.]. Wake Co.—Raleigh, [rec. by Brimley]; Johnston Co.—Benson, [rec. by Brimley]. VIRGINIA: Fluvanna Co., 1 ♀, (W. Robinson), [U. S. Nat. Mus.]. MARYLAND: Montgomery Co.—Plummers Island, 1 ♂, June 22, 1912, (Schwarz and Barber), [Acad. Nat. Sci. Phila.].

Species of Psorthaspis Unrecognized from Their Descriptions

Psorthaspis eubule (Cameron) new combination

1893. *Pompilus eubule* Cameron, Biol. Centr.-Amer., Hymen., II, p. 187, pl. 11, figs. 8 and 8e. [Mexico.]
1911. *Pedinaspis eubule* Schulz, Zool. Annalen, IV, p. 119.

Black, reflecting blue and purple. Wings fuliginous. Clypeus rounded. Length, 15 mm.

Cameron does not state the sex of the type of this species, but as he compares it with *telemon* it is probably a female, although the figure of the face suggests a male. It probably belongs to the group *morosa.*

Distribution.—MEXICO: Durango; Guerrero.

Psorthaspis unicolor (Smith) new combination

1855. *Ferreola unicolor* Smith, Catal. Hymen. Insects in Coll. Brit. Mus., III, p. 170. ♀. [Peru.]
1897. *Pompilus capucinus* Dalle Torre, Catal. Hymen., VIII, p. 278.

♀. All black, with violet lustre and dark wings. Length, 13 mm.

This species also probably belongs to the group *morosa*. It is the only species of the genus known from south of Colombia.

Distribution.—PERU: Eastern part.

American Species Formerly Placed in Pedinaspis but Which do not Belong to Psorthaspis

Pedinaspis albocaudata Malloch

1928. *Pedinaspis albocaudata* Malloch, Proc. Ent. Soc. Wash., XXX, p. 101. ♂. [Arizona.]

See: *Allocyphonyx albocaudatus* (Malloch).

Pedinaspis margaretella Rohwer = *Cryptocheilus margaretella* (Rohwer) new combination

1914. *Pedinaspis margaretella* Rohwer, Proc. U. S. Nat. Mus., XLVII, p. 514. ♂. [Guatemala.]

This assignment is made from a paratype loaned me. The hind tibiae are serrate, the clypeus inflated, the front claws asymmetrical.

Pedinaspis anomala Banks

1917. *Pedinaspis anomala* Banks, Bull. Mus. Comp. Zool., LXI, p. 100. ♀. [Texas.]

See: *Chelaporus anomalus* (Banks).

TRIBE APORINI

1815. *Aporida* Leach, Edinburgh Encyc., IX, p. 149.
1902. *Aporinae* Ashmead, Can. Ent., XXXIV, p. 79.
1902. *Planicepini* Ashmead, Can. Ent., XXXIV, p. 132.
1929. *Aporini* Haupt, Mitt. Zool. Mus. Berlin, XV, pp. 112 and 186.

♀. Head vertical, lens-shaped, usually with a somewhat sharp upper margin separating the vertex from the short occipital surface; eyes long and narrow, reaching onto top of head; ocelli small and situated well toward level of top of eyes; antennae inserted close together, but the sockets not

attingent, low on face, below, at or well above level of bottom of eyes; antennal fossae extending obliquely to the eyes, or vertical and parallel; in the former case their inner margins form a pronounced V-shaped termination to the raised median portion of the front, the tip of the V being formed by the perpendicular apex of the spatium frontale; the antennal fossae if vertical extend well up toward the ocelli, and the middle of the front forms an elevated ridge with rounding lateral margins; the spatium frontale drops perpendicularly to the level of the clypeus, forming with the area frontalis a sort of nasus between the antennae, sometimes oblique instead of vertical, rarely (certain *Euplaniceps*) broadly connecting the front and clypeus on the same plane, but in this case at the level of the eyes, not elevated as in *Psorthaspis;* clypeus always transverse, always extending on the same plane from eye to eye, this being at the level of the eye-margin, its entire surface always in one plane, except that while sometimes entirely flat it may be slightly convex, and never more sloping at base; clypeal suture complete, straight, very near to the antennal sockets, which are on the same level below as the clypeus, so that the antennal fossae are not well-marked below the antennae; eyes bare or hairy; inferior margin of mandibles simple, or armed with a tooth, sometimes with a notch, the tooth sometimes erect, long and acute. Antennae short, the segments slender, the scape straight and cylindrical, or somewhat flattened, sometimes also slightly curved.

Pronotum long, but of variable proportions, usually parallel-sided, always longer than the mesonotum, sometimes twice as long; the pronotum with only dorsal and lateral surfaces, the former relatively flat, the collar in its median portion raised almost to the level of the dorsal surface of the pronotum, so that in profile the dorsal outline of the latter declines slightly and gently to the collar; streptaulus well defined only at the shoulders; mesonotum short, with only lateral furrows; metapostnotum very short, transversely linear, in a deep constriction, or fully concealed; mesosternum ending behind in two laminae, or not. Propodeum with dorsal, lateral, and posterior faces rounding gradually into one another, the posterior one sometimes but little differentiated, contours even and surface smooth or finely granulated, never striate.

Wings with only two submarginal cells, the second of which, trapezoidal or nearly triangular, primitively receives only one recurrent vein but in some genera receives both; the second recurrent vein rarely occurs so close to the first as to cause the height of the third discoidal cell to exceed the length, abnormally the second recurrent vein may be absent; the transverse median vein of the forewings opposite or beyond the basal vein and the cubitus of the hind wing postfurcal; the posterior lobe of the hind wing long and sometimes linear.

Front coxae conical; the front femora usually strongly swollen, but not always so; front tibiae short, stout, variously spinose beneath and at apex, or nearly spineless, and the front tarsi short, broad, some intermediate segments transverse, devoid of a true comb, but sometimes with short thick spines which may become flattened spurs, forming a fossorial comb (*Plectraporus*);

all tarsal claws with an erect tooth beneath (see Haupt's fig. 84 E, F,[26] but in our species the tooth more as in D) or cleft; upper surface of hind femora near apex usually with short spines in pits; the apex of hind tibiae with splayed-out spines of different lengths, the hind tibiae and tarsi spinose.

♂. The males are readily distinguished from those of other American Pompilinae by having only two submarginal cells and a rounded propodeum. They resemble the females in a general way, but are more slender, and do not have the distinctive head and pronotal characters so well marked, nor are the anterior femora incrassate; the claws of each anterior leg are asymmetrical.

There is considerable variation in the shape of sternite 9, and in the genitalia, which will be discussed in connection with the several genera, and is shown on plate IV.

Evolution within the Aporini

As in all tribes of Pompilinae (except Epipompilini) the primitive coloration, found in *Aporus,* consists of an entirely black integument, with black hair and uniformly dark wings; the body appears blue, green or purplish by being overlaid with a microscopic tomentum which reflects the light; also, as in *Psorthaspis,* the development of brighter colors is confined to the female sex, except in a few instances, but the males tend to acquire hyaline wings, and silvery pubescence.

This sombre coloration of *Aporus* is maintained by all American females of that genus, except those of the subgenus *Neoplaniceps;* it also characterizes the females of *Chelaporus* and some specimens of *Alloporus;* it does not reappear in the remaining groups, all of which have become more specialized both in color and in other structures. The females of many Palearctic species of *Aporus* have the abdomen more or less red; so do females of *Planiceps, Drepanaporus,* many females of *Allaporus,* and of some *Notoplaniceps* and *Odontaporus.*

The females of the South American subgenus *Notoplaniceps* have developed sericeous pubescence, along with the purple. Those of the Antillean subgenus *Neoplaniceps* may or may not retain a purplish irridescence, but either have developed red legs (*tarsalis*) or strongly bronzed wings and red abdomen (*prolixus*), the latter coloration also occurring in three other Antillean genera.

[26] Mitt. Zool. Mus. Berlin, XVI, 1930.

The color of the most primitive species of *Odontaporus,* namely the Central American *notabilis* Smith, differs from that of *Aporus* only by the development of a pair of yellow spots on both tergites 2 and 3 and a basal yellow spot on tergite 6, as well as a silvery sheen on the pleural surfaces; this is a step toward the *Euplaniceps* color-type.

Another development within the genus *Odontaporus* is found in the new species *aureolus* and *comptus;* in these the color-type simulates that of the species group *picta* in the genus *Psorthaspis,* and differs from that of other *Aporini:* the wings are banded, with a tendency for the pale parts to be overlaid by white tomentum, the second tergite has a pair of yellow spots, the fourth or fourth and fifth are yellow, and the dorsum and head are more or less overlaid by long, brightly colored tomentum; these form one evolutionary line of color-specialization, not geographically peripheral.

Another evolutionary line appears in the Antilles, where *Odontaporus cupripennis* has acquired fully bronzed wings, and a coppery sheen on the body, while in the Cuban and Porto Rican *O. simulatrix,* with its red abdomen and banded pronotum, the Antillean color-type is perfected. This is repeated with astonishing fidelity in the Cuban genus *Drepanaporus* and in *Planiceps antillarum* from Cuba and Haiti.

The subgenus *Notoplaniceps* of *Aporus,* and the genera *Rhabdaporus, Aspidaporus* and *Euplaniceps* replace the others on the continent of South America, to which they are confined. The color-pattern of the three genera last mentioned is constant, and is a further modification of the type already encountered in *Odontaporus notabilis* Smith of Central America: the wings are always banded, tergites 2 and 3 spotted (or the spots united into bands) and the last tergite has a median basal spot or stripe. At the same time these three genera possess the maximum structural differentiation from *Aporus.* It is clear that they represent the most specialized evolutionary line within the tribe; arising from the Central American *Odontaporus,* this is not only the line of maximum color and structural modification, but is strictly peripheral from the standpoint of distribution.

Distribution.—It is apparent that the New World is the center of origin of this tribe, for here we not only have a greater abun-

dance of primitive forms, but more genera, subgenera and species. The subgenus *Aporus* is primitive and has its greater number of American species in the western U. S. and Mexico, which may be considered the center of dispersal; the closely similar monotypic subgenus *Plectraporus* is confined to California. Some all-black species of the subgenus *Aporus* have reached the Palearctic Region, but there the females of the greater number have a more or less red abdomen. The genus *Planiceps,* with one Cuban species and one Mediterranean, is the only other member of the tribe that has reached the Old World; in facial conformation it shows a more exaggerated development of tendencies evident in the Antillean and South American subgenus *Notoplaniceps,* and in having an erect tooth under the mandibles it conforms with several Neotropical groups. The genus *Odontaporus* is confined to Central America and the Antilles; it has given rise in the latter area to the Cuban genus *Drepanaporus,* and to the exclusively South American genera *Euplaniceps, Rhabdaporus* and *Aspidaporus* of which there are a considerable number of known species and probably many more to be discovered. These are the most specialized genera of the tribe. Of the two remaining genera, *Chelaporus* and *Allaporus,* each monotypic, the latter is confined to the southern United States and Pacific Coast, the former to Texas and Mexico.

Key to the Genera of Aporini

Females

1 a. Antennal fossae extending obliquely laterad toward the eyes, the spatium frontale forming a broad V-shaped prominence, the arms of which flare outward toward the eyes, as shown in Haupt's figs. 41 and 47; pronotal disc not acutely margined.....3

b. Antennal fossae extending upwards, paralleling the inner orbits, the front between them and the area frontalis forming a more or less elevated vertical ridge; second submarginal cell receiving two recurrent veins or the pronotal disc margined laterally by an acute projecting carina; wings banded; tergites 2 and 3 spotted or banded, and tergite 6 entirely orange or with a basal spot or stripe.....2

2 a. Pronotal disc not margined by an acute carina; front femora incrassate, one-third to one-half as wide as long; second submarginal cell receiving the second recurrent vein at some distance before the second transverse cubital vein.....**Euplaniceps** Haupt

b. Pronotal disc margined laterally by an acute projecting carina; front femora not incrassate, one-quarter as wide as long; second recurrent vein approximately opposite the second transverse cubital vein **Aspidaporus** new genus

3 a. Second submarginal cell receiving two recurrent veins; eyes bare; inferior margin of mandibles simple.....8

b. Second submarginal cell receiving only one recurrent vein, the second opposite or beyond the second transverse cubital vein.....4

4 a. Claws cleft, the inner ray truncate; inferior margin of mandibles toothed; eyes bare.....7

b. Claws with an inner tooth, or, if cleft, the inner ray acute.....5

5 a. Inferior margin of mandibles interrupted by a notch or erect tooth; abdomen colored or spotted, or wings banded.....6

b. Inferior margin of mandibles simple; integument and wings entirely black in American species, except two white dots on tergite 2 of one **Aporus** Spinola

6 a. Clypeus a very short, arcuate band; antennal sockets entirely or almost entirely below level of eyes (see Haupt's[26] fig. 41); eyes hairy. (Mediterranean and Cuban).....**Planiceps** Latreille

b. Clypeus longer, not band-like nor arcuate; antennal sockets entirely above lower level of eyes; eyes bare. (Central American and Antillean).....**Odontaporus** new genus

7 a. Outer ray of tarsal claw (Plate V, fig. 30) bent at an angle, from this angle to apex long, straight, slender, the inner ray scarcely broader. Integument entirely black; wings not coppery. (Brazilian) **Cosmiaporus** new genus

b. Outer ray of tarsal claws evenly curved, the inner ray about twice as wide. Abdomen red and wings coppery. (Cuban) **Drepanaporus** new genus

8 a. Tarsal claws with an acute tooth beneath; abdomen black or red; wings unicolored.....9

b. Tarsal claws bifid, the inner ray broad and truncate; tergites 2 and 3 spotted, last tergite red; wings banded.....**Rhabdaporus** new genus

9 a. Both third discoidal and second submarginal cells longer than high; front tibiae armed with two stout decurved claws at apex; hind ocelli as far from hind margin of head as they are apart; integument black, overlaid by tomentum that gives it a blue sheen **Chelaporus** new genus

b. Third discoidal and second submarginal cells higher than long; apex of front tibiae with only short spines; hind ocelli removed from hind margin by about three-eighths of their distance apart; black, without blue sheen, or the abdomen red.....**Allaporus** Banks

Males

1 a. Second recurrent vein situated basad of second transverse cubital vein, or opposite it; vertex not acutely margined.....4
b. Second recurrent vein situated apicad of second transverse cubital vein, usually distinctly so, but only slightly so in the South American subgenus *Notoplaniceps* in which vertex is acutely margined; sternite 9 entire; calcaria black.....2
2 a. Parameres extending much beyond apex of parapenial lobes, lanceolate, curved, or elbowed, the apical part strap-like or filamentous (Plate IV, fig. 18).....3
b. Parameres rod-like, straight, not extending as far as apex of parapenial lobes (Plate IV, fig. 17).....**Odontaporus** new genus
3 a. Parameres (Plate IV, figs. 18–22) lanceolate, or strap-like, or slender and evenly curved or elbowed, or almost filamentous, but not broad at base with a narrow appendage; volsellae (Plate IV, fig. 19 b) shorter than the parapenial lobes.....**Aporus** Spinola
b. Basal half of parameres a broad lamina, the part beyond the elbow forming a narrow appendage (Plate IV, fig. 23); volsellae as long as the parapenial lobes.....**Drepanaporus** new genus
4 a. Sternite nine entire (Plate IV, figs. 1–5); parameres not broadly spatulate, shorter than parapenial lobes (Plate IV, figs. 12, 14 and 15); volsellae not spatulate, extending but little beyond the apices of the parapenial lobes.....5
b. Sternite nine bifid (Plate IV, fig. 6); calcaria black; parameres very broadly spatulate (Plate IV, fig. 10), overlying the broadly spatulate volsellae (Plate IV, fig. 11); both parameres and volsellae extending much beyond apices of the parapenial lobes...**Chelaporus** new genus
5 a. Calcaria white; parameres parallel-sided and in profile truncate; third discoidal cell longer than high. (South America).....6
b. Calcaria black; parameres a little widened apically; third discoidal cell higher than long, or open. (North America).....**Allaporus** Banks
6 a. Second recurrent vein opposite the second transverse cubital vein **Aspidaporus** new genus
b. Second recurrent vein basad of second transverse cubital vein **Euplaniceps** Haupt

Working key to genera of males

1 a. Second submarginal cell receiving two recurrent veins, or the second opposite the second transverse cubital vein.....7
b. The second recurrent vein ending beyond the second transverse cubital vein (very slightly beyond in *Aporus* [*Notoplaniceps*] *fenestralis* from South America which has a sharply margined vertex).....2
2 a. Continental 4
b. Antillean 3

3 a. Habitat Cuba or Haiti; an ivory band on posterior margin of pronotum **Drepanaporus** new genus

b. Habitat Jamaica and Porto Rico; sometimes with an ivory band on pronotum.....**Odontaporus** new genus

c. Habitat Virgin Islands to Grenada; no ivory band on pronotum **Aporus** Spinola (**Neoplaniceps** new subgenus)

4 a. Habitat South America.....6

b. Habitat North or Central America.....5

5 a. Abdomen not spotted **Aporus** Spinola (**Plectraporus** new subgenus and **Aporus** Spinola)

b. Abdomen spotted (in species of which males are known) **Odontaporus** new genus

6 a. Vertex sharply margined, and occipital surface concave, smooth and polished.....**Aporus** Spin. (**Notoplaniceps** new subgenus)

b. Head probably not as above.....**Cosmiaporus** new genus* [27]

7 a. Tarsal spurs (of known species) white. (South America).....9

b. Tarsal spurs black. (United States and Mexico).....8

8 a. Length 3 mm.; third discoidal cell higher than long, or open; pubescence largely dark. (Southern United States and Pacific Coast) **Allaporus** Banks

b. Length 8 to 9.5 mm.; third discoidal cell longer than high; conspicuously cinereous. (Texas).....**Chelaporus** new genus

9 a. Second recurrent vein ending distinctly before the second transverse cubital vein; abdomen spotted in the only known species **Rhabdaporus** n. gen.,* and **Euplaniceps** Haupt

b. Second recurrent vein ending opposite the second transverse cubital vein; abdomen not spotted.....**Aspidaporus** new genus

APORUS Spinola

Pompilus auct. (nec Fabricius, 1798).

1808. *Aporus* Spinola, Insect Ligur., II, p. 5.

1867. *Planiceps*, Cresson, Trans. Amer. Ent. Soc., I, p. 111, et auct. (nec Latreille, 1825).

1902. *Melanaporus* Ashmead, Can. Ent., XXXIV, p. 132.

1927. *Aporus* Haupt, Deutsche Ent. Zeitschr., 1926–27, Beihefte, pp. 261 and 264.

1930. *Aporus* Haupt, Mitt. Zool. Mus. Berlin, XVI, p. 730.

Type of genus: *Aporus unicolor* Spinola.

♀. Angle of area frontalis perpendicular to plane of front or of clypeus; antennal fossae oblique; antennal sockets at or close to base of clypeus, their inferior margin below, at, or well above the level of the bases of the eyes; the hind ocelli twice as far apart as distant from the hind margin of the head, which is concave; inferior margin of mandibles simple. Greatest

[27] An asterisk indicates that males are as yet unknown, and their position in the key is presumptive.

width of pronotum equal to from .6 of its length to its entire length; metapostnotum transversely linear, in a deep incision, laterally vertical, not striate. Dorsoventral width of front femora equal to from about one-third to nearly one-half of their length; preapical spines on hind margin of front tibiae underneath from none to two; armature of apex of front tibiae, other than strigil, from one spine to three short flat spurs (*Plectraporus*); hind margin of V-shaped notch under front tibia at apex with one or more spines or three flat spurs (*Plectraporus*); front tarsal segments without or with short lateral spines, or those at apex of the extended posterior angles of segments 1–3 forming a row of three flat, blunt spurs (*Plectraporus*); upper surface of hind tibiae with two to three rows of spines; all claws with an erect tooth on margin, (as in Haupt's [26] fig. F), or approximating a bifid type or bifid (*Notoplaniceps* and *Neoplaniceps*). Second submarginal and third discoidal cells longer than high; the second recurrent vein beyond the second transverse cubitus. Black with dark violaceous or coppery wings, the integument given a blue sheen by minute tomentum, or vestiture silvery; sometimes the abdomen red (*A.* [*Neoplaniceps*] *prolixa*) or the legs (*A.* [*Neoplaniceps*] *tarsalis*) also red.

♂. Black, sometimes with pronotal stripe or red legs; vestiture black to white; wings infuscated or hyaline.

Vertex sharply margined or not. Last sternite (Plate IV, figs. 1–3) compressed and keeled or flat and merely carinate; parameres (Plate IV, fig. 18) always extending well beyond apices of parapenial lobes and slender, or in *Plectraporus* (Plate IV, fig. 19) with a lanceolate head, margins often with erect spines; volsellae short and tapered or strap-like, not reaching apex of parapenial lobe.

Distribution.—Palearctic, Nearctic and Neotropical Regions.

Key to the Subgenera of Aporus

Females

1 a. Eyes strongly hairy.....3
  b. Eyes bare; tarsal claws with an inner tooth.....2
2 a. Posterior apical angle of segments of front tarsus not dilated, bearing only a short acute spur, much shorter than the apical width of segment 2; hind femora not hairy.....**Aporus** Spinola
  b. Posterior apical angle of segments 1 to 3 of front tarsus dilated and terminating in a long flat spur, the three forming a fossorial comb, the first two each as long as the apical width of segment two; hind femora strongly hirsute.....**Plectraporus** new subgenus
3 a. Tarsal claws cleft; integument entirely black. (South America) **Notoplaniceps** new subgenus
  b. Tarsal claws with an erect tooth beneath; legs or abdomen red. (Antilles).....**Neoplaniceps** new subgenus

Males

1 a. Vertex not margined, or if so, then the occipital surface not smooth and evenly flattened, and shorter at the median line than the distance between the hind ocelli.....2

b. Vertex sharply margined posteriorly, the occipital surface very flat (concave in cross-section), smooth and polished, shorter on the median line than the distance between the hind ocelli. (Habitat continental South America).....**Notoplaniceps** new subgenus

2 a. Habitat, North America. Parameres (Plate IV, figs. 20–22) less slender 3

b. Habitat, Virgin Islands and Lesser Antilles. Parameres (Plate IV, fig. 18) very slender, with erect marginal bristles **Neoplaniceps** new subgenus

3 a. Last sternite strongly compressed, keeled, in ventral view linear, in profile hood-shaped; parameres (Plate IV, fig. 19) lanceolate, their under surface traversed obliquely by a nearly longitudinal row of strong setae, the side margins devoid of setae **Plectraporus** new subgenus

b. Last sternite (Plate IV, figs. 1–3) broad, nearly flat, but its sides sloping slightly from a low median ridge, in ventral view its lateral margins parallel or divergent towards the apex which is subtruncate or acute; no such row of setae on under surface of parameres, but at least the outer edge bearing spines, more or less perpendicular to the surface, suggesting the leaf of a sundew (Plate IV, figs. 20–22) **Aporus** Spinola

Subgenus **APORUS** Costa

♀. Lower margins of antennal sockets at or above the lower level of the eyes; clypeus transverse but not linear, straight; inferior margin of mandibles simple. Front femora incrassate; first three segments of front tarsi not dilated at postero-apical angles, and without long flattened spurs on these, therefore without a comb, and no series of short flat spurs on posterior margin of under surface of front metatarsus; tarsal claws with a tooth on inner margin. Integument black, overlaid with a fine tomentum giving a blue-green or purple sheen; in Palearctic species the abdomen usually more or less red; hair black; wings fusco-violaceous.

♂. Integument black, in one species with a frontal band; vestiture black to entirely white; wings infuscated or hyaline. Vertex not sharply margined. Last sternite (Plate IV, figs. 1–3) nearly flat, but with a low median ridge. Parameres (Plate IV, figs. 20–22) much longer than parapenial lobes, slender, usually strap-shaped, elbowed, and with erect marginal setae; volsellae much shorter than parapenial lobes, tapered or strap-shaped.

Distribution.—Palearctic, Nearctic, Neotropical Regions; Upper and Lower Austral and Tropical Zones of United States and Mexico.

Key to the Species of the Subgenus Aporus

Females

1 a. Vertex not acutely margined.....2
b. Vertex acutely margined; apex of mesosternum with two acute lobes, separated by a broad, shallow, acute, straight-sided notch, the emargination laterad of each lobe shallow; front tibiae and metatarsi devoid of lateral and terminal spines. (Texas to Yucatan) **bequaerti** (Banks)
2 a. Apex of mesosternum not or barely forming lobes, the median notch wanting or slit-like, or at most slightly indicated or broad and shallow with concave sides.....3
b. Apex of mesosternum with prominent acute lobes, between which the median notch is deep and acute. (Eastern United States to Texas) **niger** (Cresson)
3 a. Tergites immaculate; third segment of antennae not or scarcely more than two times longer than its greatest width.....4
b. Tergite 2 with white lateral spots; third segment of antennae more than three times longer than its greatest width.....**yavapai** (Banks)
4 a. Front femora but little inflated, the width equal to .3 of length; mesosternal notch very broad and shallow, arcuate, the lobes small but acute. (Eastern United States).....**hermes** new species
b. Front femora more strongly inflated, the width equal to .45 of length; mesosternal notch indistinct, narrow and with convex sides, the lobes not distinctly acute. (Pacific Coast).....**luxus** (Banks)

Males

1 a. Tibial spurs black.....2
b. Tibial spurs white.....**calcaratus** (Fox)
2 a. Sides of last sternite (Plate IV, figs. 1 and 2) dentate basally. (This cannot be seen except by dissection), truncate or blunt at apex.....4
b. Sides of last sternite (Plate IV, fig. 3) simple, the apex acute.....3
3 a. Pronotum not banded; parameres (Plate IV, fig. 22) slender, pointed, with few setae, some of which are set a little back from margin. (Eastern United States).....**hermes** new species
b. Pronotum with an ivory band close to posterior margin; parameres curved but not elbowed, the spines on outer margins evenly spaced forming a comb, one spine at middle of inner margin, apical portion not slender nor pointed. (Mexico).....**zapotecus** new species
4 a. Part of last sternite apicad of lateral teeth slender, one-third as wide as long (Plate IV, fig. 2); parameres (Plate IV, fig. 21) strongly elbowed, the spines on outer margin irregularly placed in groups, none on inner margin, apical portion slender and pointed. (Eastern United States).....**niger** (Cresson)

b. Part of last sternite apicad of teeth broad, one-half as wide as long, its apex slightly emarginate in middle (Plate IV, fig. 1); parameres (Plate IV, fig. 20) broad and flat, strap-shaped, blunt, the spines stout and set on the margin. (Pacific Coast) ..... **luxus** (Banks)

Aporus (Aporus) luxus (Banks) new combination
(Pl. IV, figs. 1 and 20.)

1914. *Planiceps luxus* Banks, Journ. N. Y. Ent. Soc., XXII, p. 304. ♀, ♂. [California.]
1919. *Planiceps luxus* Banks, Bull. Mus. Comp. Zool., LXIII, p. 242.

♀. Integument entirely black, the overlying tomentum with a blue or green reflection, this conspicuous on bases of wing-veins; hair black. Wings black with dull violaceous reflection.

Vertex rounding into posterior surface of head without a distinct carina; posterior margin as seen from above concave; ocellar measurements: a 8, b 7, c 20, d 15. Antennal measurements: 15:2.5:9:9.

Dorsal measurements: a 30, b 18, c 36; posterior margin of mesosternum without distinct lobes, merely sinuate, with a shallow median emargination. Front femora three-sevenths as wide as long; posterior margin of under surface of front tibiae with about four short stout spines before the articulatory incision, and one at apex of same; a group of spines on outer side of apex; front metatarsus (apart from the median row underneath) with four or five short inconspicuous and somewhat flattened spines along posterior margin, which tend to be in pairs, and similar spines or pairs of spines at apices of tarsal segments, all short and difficult to see clearly; longer hind tibial spur one-half as long as metatarsus. Length, 8 to 14 mm.[28]

♂. Very like the female, the bluish color sometimes weak. Longer spur of hind tibiae .85 as long as metatarsus.

Sternite 9 (Plate IV, fig. 1) broad and truncate. Aedeagus a slender lightly chitinized rod, seen in profile to extend nearly to tip of the parapenial lobes, beneath which it is well concealed; parapenial lobes heavily chitinized, in lateral view with a small ventral lamina which gives them a nearly parallel-sided, bluntly terminated profile; digitus volsellaris very short, terminating before the origin of the lamella of the parapenial lobes; in profile the parameres (Plate IV, fig. 20) extended obliquely downward, then bent caudad in a horizontal plane, making a distinct angle beneath, strap-shaped and from above showing only their thin edge at base, gradually twisting to expose the flat surface at apex where they nearly meet one another; the strong erect marginal setae, without any on the disc, long, numerous at base, and few on apical half, suggest the leaves of a fly-catching plant. Length, 6 to 7 mm.[29]

Distribution.—Rocky Mts. to Pacific Coast of North America.

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[28] Description drawn from a specimen from Berea Cañon, California.
[29] Description from paratype.

Key to the Females of the Subspecies of Aporus (Aporus) luxus

Females

Posterior surface of front femora with scanty erect hair..**assimilis** (Banks)
Front femora devoid of erect hair.....**luxus** (Banks)

Aporus (Aporus) luxus subspecies **luxus** (Banks)

Distribution.—Upper and Lower Sonoran Faunas.

CALIFORNIA: San Diego Co.—National City, 1 ♀, 2 ♂, May 15, [*types,* Mus. Comp. Zool.]. Orange Co.—Brea Cañon, 1 ♀, September 18, 1917, (E. G. Osterhoudt), [Cornell Univ.]. Los Angeles Co.—Whittier, 1 ♀, November 27, 1910, (P. H. Timberlake), [U. S. Nat. Mus.]. Claremont, [rec. by Banks]. Santa Clara Co., 1 ♀, May 1902, (Coleman), [Cornell Univ.]. Alameda Co.—Berkeley, 7 ♀, July 27 and August 10, 1910 (J. C. Bridwell), [U. S. Nat. Mus., 5; Acad. Nat. Sci. Phila., 2].

Aporus (Aporus) luxus subspecies **assimilis** (Banks)

1917. *Planiceps assimilis* Banks, Bull. Mus. Comp. Zool., LXI, p. 100. ♀. [California.]
1919. *Planiceps assimilis* Banks, Bull. Mus. Comp. Zool., LXIII, p. 242.

The genitalia of the male of this form appear identical with those of the types of *luxus* from San Diego Co., California. I know of no way to distinguish the males from the typical form, nor any distinction between the females, except in the presence or absence of hair on the front femora. Some specimens from San Francisco are difficult to allocate.

Distribution.—Upper Sonoran and Transition Zones of Pacific Coast and Great Basin. BRITISH COLUMBIA: Penticton, ♀, [*type,* Mus. Comp. Zool.]. WASHINGTON: 1 ♀, July 20, 1890, (T. Kincaid), [Cornell Univ.]. Fishtrap Lake, 1 ♂, July 8, (J. M. Aldrich), [U. S. Nat. Mus.]. Whitman Co.—Wawawai, 1 ♀, September 6, 1908, (W. M. Mann), [Cornell Univ.]. Klickitat Co.—Mt. Adams, 3500 ft. alt., 2 ♀, July 22, 1925, (L. A. Morley), [U. S. Nat. Mus.]. Adams Co.—Ritzville, 2 ♀, 2 ♂, June 26, 1923, (M. C. Lane), [U. S. Nat. Mus.]. OREGON: Boiler Bay, 1 ♀, September 28, 1929, (R. E. Dimick), [U. S. Nat. Mus.]. Corvallis, 43 ♀, 13 ♂, August 14, 1907, September 15, 1908, (J. C. Bridwell), [1 ♀, 1 ♂, Acad. Nat. Sci. Phila.; 38 ♀, 10 ♂, U. S. Nat.

Mus.; 3♀, 2♂, Cornell Univ.]. CALIFORNIA: Humbolt Co.—Samoa, 1♀, May 23, (H. S. Barber), [U. S. Nat. Mus.]; Samoa Beach and dunes, 1♀, 1♂, June 28, 1907, (J. C. Bradley), [Cornell Univ.]; Arcata, 1♀, July 26, 1927, (J. C. Bradley), [Acad. Nat. Sci. Phila.]. Shasta Co.—Sisson, 2♂, August 14, 1908, (J. C. Bradley), [Acad. Nat. Sci. Phila.; Cornell Univ.]. IDAHO: Priest Lake, 1♀, August 1901, (C. V. Piper), [U. S. Nat. Mus.]. Twin Falls Co.—Hollister, 1♀, 1♂, August 8, 1929, [U. S. Nat. Mus.]. UTAH: Salt Lake Co., 2♀, [Acad. Nat. Sci. Phila.; Cornell Univ.].

Females from San Francisco (Ingleside), Mission Valley, and Tauquitz Valley, Mt. San Jacinto, California, may belong to this form.

Aporus (Aporus) niger (Cresson) new combination
(Pl. IV, figs. 2 and 21.)

1867. *Planiceps niger* Cresson, Trans. Amer. Ent. Soc., I, p. 136. ♀. [Connecticut, Georgia.]
?1872. *Planiceps feralis* Cresson, Trans. Amer. Ent. Soc., IV, p. 207. ♂. [Texas.]
?1879. *Planiceps concolor* Patton, Bull. U. S. Geol. & Geogr. Survey, V, p. 367. ♀. [Kansas.]
1893. *Planiceps minor* Fox, Journ. N. Y. Ent. Soc., I, p. 55. ♀. [Florida.] New Synonymy.
?1893. *Planiceps dubius* Fox, Journ. N. Y. Ent. Soc., I, p. 55. ♂. [Florida.] (nec *Aporus dubius* Van der Linden, 1827).
1897. *Pompilus clericus* Dalle Torre, Cat. Hymen., VIII, p. 281.
?1897. *Pompilus feralis* Dalle Torre, Cat. Hymen., VIII, p. 288.
1917. *Planiceps compressus* Banks, Bull. Mus. Comp. Zool., LXI, p. 99. ♀. New Synonymy.

♀. Black; tomentum with blue-green to bronzy-purple reflection; wings infuscated without much reflection.

From in front, vertex forming a nearly continuous curve with the orbits; from above, posterior margin slightly concave; vertex not sharply margined, posterior surface of head rounding laterally, concave medially, a little higher than distance between hind ocelli; measurements of head: a 30, b 31, c 17, d 18, e 23, g 19, h 11, i 17; ocellar measurements: a 12, b 5, c 20, d 15; clypeus with a row of setigerous punctures in front of anterior margin, except at sides.

Dorsal measurements: a 20, b 25, c 10; lateral margins of dorsal surface of pronotum straight, parallel, marked by a weak ridge; streptaulus present on side-pieces only at humeri, a small fossa above spiracular tubercles; meso-

sternal notch pronounced, V-shaped, the laminae prominent. Front femora slightly incrassate, their width equal to .3 of their length; hind margin of under surface of front tibiae with about five spines the last of which is in the articulatory notch, a few spinules at apex of tibia; front tarsal segments not obviously spinose laterally; longer spur of hind tibiae one-half as long as metatarsus; hind tibiae with only a few, very short spinules. Length, 9 to 13 mm.[30]

♂. Black; pubescence white, scanty; calcaria brown; wings subhyaline, stained slightly brownish.

Front claws strongly asymmetrical, the anterior one of each pair with a strongly curved and prolonged outer ray, the inner tooth of the posterior one acute.

The last sternite (Plate IV, fig. 2) is more slender than in *luxus,* less truncate at apex than in that species, but blunter than in *hermes,* and as in the former the sides of that sternite are produced at base forming a tooth, visible only when dissected. Parameres (Plate IV, fig. 21) strongly elbowed, slender and pointed, with strong erect spines on outer margin, none on inner except sometimes one or two at apex; volsellae much shorter than parapenial lobes, parallel-sided, obtuse, about four long bristles underneath; expanded laminae of parapenial lobes longer than their dorso-ventral width. Length, 5 to 8 mm.

Cresson states that his description of *feralis* is of a female. The holotype in the collection of the American Entomological Society, a unique specimen, is a male and agrees precisely with Cresson's description, which a female would not do, so that there is little doubt but that the specimen is the real type, and that Cresson erred in stating the sex; without examination of the genitalia its identity can not be established, but I have placed it here with a query; it could, however, be the male of *bequaerti;* possibly of *yavapai,* or of *hermes.* There is less doubt that *dubius* Fox, of which I have examined the type but not the genitalic structures, is based on a male of *niger,* but it could be of *hermes.*

Distribution.—TEXAS: 1 ♀, [Acad. Nat. Sci. Phila., type of *feralis*]. Bexar Co.—San Antonio, 1 ♀, November 9, 1905, (J. C. Bridwell), [U. S. Nat. Mus.]. KANSAS: Douglas Co.—Baldwin, 2 ♀, June, (J. C. Bridwell), [U. S. Nat. Mus.; Acad. Nat. Sci. Phila.]. MISSOURI: St. Louis, 1 ♀, (P. Rau), [U. S. Nat. Mus.]. FLORIDA: 1 ♂, [U. S. Nat. Mus., type of *dubius*]. GEORGIA: 1 ♀, [Acad. Nat. Sci. Phila., *lectotype*]. Clarke Co.—Athens, 1 ♀, June 15, 1909, (J. C. Bradley), [Cornell Univ.]. VIRGINIA:

[30] Description drawn from a specimen from Jackson Island, Maryland.

Fairfax Co.—Rosslyn, 2 ♂, (H. H. Smith), [U. S. Nat. Mus.; Acad. Nat. Sci. Phila.]; Falls Church, 1 ♀, August 4, 1913, (G. M. Greene), [U. S. Nat. Mus.]. MARYLAND: Montgomery Co.—Cabin John, 1 ♂, June 1916, (R. M. Fouts), [U. S. Nat. Mus.]; Jacksons Island, 1 ♀, August 8, 1920, (H. S. Barber), [Cornell Univ.]. ?CONNECTICUT: 1 ♀, [Acad. Nat. Sci. Phila., *paratype*].

Aporus (Aporus) hermes new species (Pl. IV, figs. 3 and 22.)

♀. Black, with a sericeous brownish purple lustre. Wings brown.

Head from in front round, the outline of vertex continuous with orbits; head measurements: a 24, b 25, c 14, d 14, e 19, f 14, h 3, i 12; vertex not acutely margined, the hind margin of head from above nearly straight; ocellar measurements: a 10, b 4, c 15, d 14.

Dorsal measurements: a 17, b 20, c 8; sides of dorsal surface of pronotum straight, parallel, margined by a weak ridge; streptaulus present on lateral pieces only at humeri, a short fossa in front of spiracular tubercles; mesosternal notch broad, shallow, curved, the laminae small, acute. Width of front femora equal to .3 of length; hind margin of under surface of front tibiae with about four spines, the last and longest on the edge of the articulatory incision, a few spines at apex; short flat spines along hind edge of metatarsus; spines of hind tibiae shorter; longer spur one-half as long as metatarsus. Length, 7 to 11 mm.

♂. Black, covered everywhere with short white pubescence, longest on apex of propodeum, and replaced on apical part of abdomen, tibiae, and tarsi by silky, golden brown pubescence. Wings lightly infumed, nearly clear at base. The longer spur of the hind tibia .9 as long as the metatarsus.

The last sternite (Plate IV, fig. 3) broad, nearly flat, slender and pointed, without basal lateral teeth, with a broad low median ridge beneath at base. The aedeagus a slender, upcurved bluntly pointed rod, shorter than the digiti volsellarum, less than one-half the length of the parameres; the parapenial lobes stout, strongly chitinized, their inner margins in dorsal view parallel, the outer converging to the pointed apex; a thin, median lamella projecting ventrally from the apical portion, giving the profile a broad, blunt outline; the volsellae shorter than the parapenial lobes, not appearing much flattened, but pointed, and strongly spinose on the under side; the parameres (Plate IV, fig. 22) slender, incurved rods, bearing not very stout marginal setae, some of which are placed close to but not on the margins, there being about five along the inner margin of the apical part; the outer or lower margin slightly angled midway. Length, 7 mm.; forewing, 6.5 mm.

Holotype.—Female, Glen Echo, Montgomery Co., Maryland, (R. M. Fouts), [Acad. Nat. Sci. Phila.].

Allotype.—Male, Woods Hole, Massachusetts, August 1917, (W. T. M. Forbes), [Cornell Univ.].

Paratypes.—1 ♀, Montauk, Long Island, New York, July 25, 1931, [U. S. Nat. Mus.]. 1 ♂, Rosslyn, Fairfax Co., Virginia, (H. H. Smith), [U. S. Nat. Mus.]. 1 ♀, Cadet, Washington Co., Missouri, (Barlow), [U. S. Nat. Mus.].

Aporus (Aporus) bequaerti (Banks) new combination

1931. *Planiceps bequaerti* Banks, Bull. Brooklyn Ent. Soc., XXVI, p. 131. ♀. [Mexico: Yucatan.]

♀. Black, the tomentum reflecting some blue but mostly dull purple; pubescence in antennal fossae and on clypeus white; outer surface of front femora with scattered short inconspicuous hairs. Wings deeply infuscated, without reflection.

Head measurements: a 35, b 37, c 22, d 18, e 24, f 21, h 5, i 16; head seen from in front with truncate upper margin, curved and converging sides; antennal sockets well above lower margin of eyes; vertex sharply carinate behind, the dorsal surface of head a narrow ridge; posterior margin seen from above a little concave; posterior surface somewhat concave, the occipital carina nearer to the upper margin than the distance between the hind ocelli; ocellar measurements: a 5, b 5, c 24, d 17. Antennal measurements: 9:3:9:9.

Dorsal measurements: a 34, b 32, c 20; sides of dorsal surface of pronotum parallel, rounding at shoulders, sharply margined; streptaulus present on anterior third of lateral pieces, a small fossa above spiracular tubercles; mesosternal laminae prominent, acute, a well-formed V-shaped notch between. Front femora strongly incrassate, their width about .6 of their length; front tibiae without lateral or apical spines, tarsi without lateral spines; hind tibiae with spines much shorter than diameter of the tibiae; longer spur one-half the length of metatarsus. Length, 12 to 15 mm.

Distribution.—MEXICO: Yucatan.—Chichen Itzá, 1 ♀, June 29, (J. Bequaert), [*holotype,* Mus. Comp. Zool.]. Tamaulipas.—Reynosa, 1 ♀, May 20, 1895, [Acad. Nat. Sci. Phila.]. TEXAS: Brownsville, 1 ♀, April 17, 1895, (C. H. T. Townsend), [U. S. Nat. Mus.].

Aporus (Aporus) yavapai (Banks) new combination

1933. *Planiceps yavapai* Banks, Psyche, XL, p. 1. ♀. [Arizona.]

♀. Black, except for two cream-colored lateral spots on tergite 2, the tomentum with blue reflection. Wings infuscated, the anterior pair more deeply and with purple reflection.

From in front the vertex nearly straight across, at the highest level of the eyes; from above the hind margin of the vertex concave, marked by a weak ridge; posterior surface of head concave medially, slightly rounding above

and laterally, a little higher than the distance between the hind ocelli; head measurements: a 34, b 38, c 21, d 17, e 19, f 26, g 10, h 4, i 16; ocellar measurements: a 8, b 6, c 21, d 18; clypeus short, curved.

Dorsal measurements: a 32, b 33, c 22; lateral margins of dorsal surface of pronotum straight, rounding at humeri, slightly divergent behind, marked by distinct rounded ridges; streptaulus present on anterior third of lateral surface, a depression in front of spiracular tubercles; mesosternal notch narrow, slit-like, the lobes small, rounded. Front femora incrassate, their width equal to .43 of their length; hind margin and apex of front tibiae without spines; the segments of front tarsi not spinose laterally; hind tibiae spinose, the spines shorter than the diameter of the tibiae; longer hind tibial spur .43 length of metatarsus. Length, 13 mm.[31]

Distribution.—ARIZONA: Fort Grant, Post Creek Cannon, Pinaleño Mts., 1 ♀, July 15–18, 1917, (C. U. Biol. Exped.), [*holotype,* Mus. Comp. Zool.].

Aporus (Aporus) zapotecus new species

♂. Integument black, a narrow ivory band near posterior margin of pronotum extending laterally onto spiracular tubercles, behind this the margin of the pronotum, a little narrower than the band, transparent; vestiture white, giving the entire insect a cinereous appearance. Wings nearly hyaline, lightly clouded in region of marginal cell.

Hind margin of head truncate; vertex not margined, rounding into posterior face of head, which, except around the edges, is rather flat, the occipital carina in the center scarcely less than the distance between the hind ocelli below the top; ocellar measurements: a 6, b 5, c 14, d 12. Antennal measurements: 21:7:9:11.

Anterior claw of each front pair curved a little differently from and more strongly than the posterior, of about equal length, its inner lobe more rounded; middle claws with the inner ray placed toward apex and nearly paralleling the apical ray but shorter, making the claw almost cleft, inner ray slightly obliquely truncate; hind claws lacking in type specimen; longer spur of hind tibia three-quarters as long as metatarsus.

Last sternite tectiform, slender, with a moderate median keel. Parameres slender, pointed, curved but not elbowed, with a strong comb of evenly spaced spines on outer margin, only one on inner, situated at about middle; dilated apex of parapenial lobe in profile shorter than dorso-ventrally thick; volsellae thick at base, tapered to a point, with about six spines on outer surface, the spines of about the length of those on parameres; cuspis volsellaris a slender hook; aedeagus a slender rod. Length, 8 mm.

Holotype.—Male, Tuxtepec, Oajaca, Mexico, October 1933, (Moises Fraire), [U. S. Nat. Mus.].

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[31] Description drawn from type.

Aporus (Aporus) calcaratus (Fox)

1893. *Planiceps calcaratus* Fox, Can. Ent., xxv, p. 115. ♂. [Florida.]

♂. Black with white calcaria; pubescence white; wings subhyaline, irridescent. Propodeum minutely punctulate, with median impressed line. Second recurrent vein opposite second transverse cubital vein. Length, 6 mm.

Distribution.—FLORIDA: southern part, ♂, (Ch. Robertson), [*holotype,* Acad. Nat. Sci. Phila.].

Species of the Subgenus Aporus which can not be Recognized from their Descriptions

Aporus (Aporus) concolor (Smith) new combination

1860. *Planiceps concolor* Smith, Journ. of Ent., I, p. 80. ♀. [Mexico.]
1893. *Pompilus* (*Planiceps*) *concolor* Cameron, Biol. Centr.-Amer., Hymen., II, p. 186.

Aporus (Aporus) pulchritarsis (Cameron) new combination

1893. *Pompilus* (*Planiceps*) *pulchritarsis* Cameron, Biol. Centr.-Amer., Hymen., II, p. 185. ♀. [Mexico: Guerrero.]

PLECTRAPORUS new subgenus

Type of subgenus: *Planiceps hirsutus* Banks.

♀. Head lenticular, as seen from in front of about the shape shown by Haupt's fig. 41 [32] for *Planiceps planiceps* Latr., female, the eyes reaching the top margin, which is slightly concave; hind ocelli placed on this upper margin, and the front ocellus a little more than the length of the pedicel below it; eyes rather narrow, nearly parallel-sided, leaving a short malar space below them; antennae as in *Planiceps,* inserted below the lower level of the eyes; front in profile not flattened, gradually elevated from above to a median point between the antennae (as in Haupt's figure, but less produced) where it abruptly drops perpendicularly to the level of the clypeus; the latter an arcuate transverse strip, as in Haupt's figure, but scarcely so narrow nor so curved; the antennal fossae confluent medially, and extending laterally broadly as shallow basins; the top of the head presenting a comparatively broad concave surface, beginning at the hind ocelli, and at right angles to the front. Scape neither curved nor flattened, but somewhat barrel-shaped or fusiform, the antennae short, not reaching to the hind margin of the pronotum.

Pronotum much longer than wide, its sides rounded, anteriorly, and transversely depressed in front, with a short rounded transverse collar; lateral faces of pronotum slightly concave, and set off from the dorsal surface by

[32] Mitt. Zool. Mus. Berlin, XVI, 1930.

a rather weakly marked rounded ridge; metapostnotum sunken and in the middle concealed. Propodeum entirely smooth and rounded, with oblique but not sharply differentiated hind face, and comparatively small spiracles without tubercles.

Legs short, especially the forelegs, the front femora strongly incrassate, the incrassate front tibiae with two short, stubby, spines at apical two-thirds, and a row of stubby spines on the hind surface of the apical margin, also a spine on inner margin at apex, one-half as long as the antenna-cleaner; the front tarsi short and stout, the hind margin of the basal segment with a row of five broad spurs (nearly one-half as broad as long), the last followed at apex by a long, curved and very broad flattened spur, projecting to side, about as long as the segment is wide and another similar spur at middle of apex, beneath, the front margin, somewhat beneath, with a row of three or four short stout spines which oppose the cleaner; this segment shorter and broader than in *Aporus;* the postero-apical angle of the first, second and third tarsal segments each dilated and bearing such a terminal sidewise projecting spur as above described, together forming an unusual fossorial type of tarsal comb; an acute stout spine underneath these, one on each segment from second and including the fourth, and continuing in line with the above described inferior apical spur of the first, and on the median line at the apices; the usual scale-like setae which in *Aporus* develop into suction-cups; last segment broad, with only an apical pair of spines underneath; last segment of hind tarsus the same, but more slender; the claws long and slender, but little curved, with a small tooth before the middle, and an empodial comb of about eight curved bristles. Haupt's fig. 42[32] of the female of *Aporus planiceps* would very nearly do to illustrate the wings, except that the second recurrent vein is a little closer to the second transverse cubitus. Abundant long hair on the body and legs forms an easy recognition character for the females of this genus.

♂. Eyes with inner margins concave, divergent above; upper outline of head from in front rounded, the hind ocelli placed on the margin; in profile temples moderately broad, eyes broad, leaving a short malar space; front strongly convex, descending perpendicularly between the antennae to the level of the antennal fossae which are not at all divided; clypeus but very slightly elevated, oval, with strongly convex apical margin; the labrum medially emarginate; mandibles slender, with a single strong tooth on the inner margin at some distance before the apex; antennae short, the scape hairy, keg-shaped, not curved nor flattened; occiput not concave except below the occipital carina which is distinct, fine, situated (above) about half way between summit of vertex and foramen magnum.

Pronotum long, posterior margin shallowly arcuate, the dorsal surface rounding to the moderately depressed collar; streptaulus sharp, but not continuing across the lateral surface nor present in front of the tubercles; mesonotum posteriorly flat; metapostonotum very short, forming a narrow transverse band, but not completely concealed. Propodeum short, with the dorsal surface rounding into the but slightly inclined posterior surface, with-

out irregularities or sculpture. Claws nearly alike, toothed, the outer ray long, slender and but little curved, the inner short and subparallel; upper surface of hind femora with a pit bearing a short spine before the apex; hind tibiae with a few rows of short spines and one of longer, at apex with short spines and longer splayed-out spines.

Last sternite in dorsal view approximately as shown for *Aporus hermes* (Plate IV, fig. 3), but compressed, keeled, and in lateral view hood-shaped. Parameres (Plate IV, fig. 19) much longer than parapenial lobes, without marginal setae, but crossed by an oblique row of setae.

Distribution.—Nearctic Region: Southern California.

Aporus (Plectraporus) hirsutus (Banks) new combination
(Pl. IV, fig. 19.)

1917. *Planiceps hirsutus* Banks, Bull. Mus. Comp. Zool., LXI, p. 99. ♀. [California.]
1919. *Planiceps hirsutus* Banks, Bull. Mus. Comp. Zool., LXIII, p. 242.

♀. Black, with blue or blue-green reflection; wings infuscated; head, thorax, propodeum and legs with dense, long, black hair, densest and longest under head and on propleura, some hair on second tergite, those on last tergite not bristly. Wing infuscated. Length, 6 to 11 mm.

♂. Black, with a bluish tinge due to very minute blue tomentum, which may be nearly lacking; the hairiness characteristic of the female present only on the head; posterior face of propodeum with a cushion of silvery pubescence. Wings infuscated, nearly clear basally. Longer spur of hind tibia .73 of the length of the metatarsus.

The phallus is shown on plate IV, figure 19; aedeagus weakly chitinized, well-concealed beneath the parapenial lobes and difficult to see, as long as the volsellae, very slender and pointed in ventral outline, but in profile seen to be a vertically flattened lamella; the parapenial lobes large, parallel and straight, heavily chitinized, much deeper dorsoventrally than wide, strongly decurved apically in profile, and with a lateral projecting rim of the dorsal surface which somewhat overhangs the volsellae; the latter lamelliform, bluntly pointed, setose underneath; the parameres much longer than the other appendages, strap-shaped, curving upwards in profile both toward base and toward apex, their edges free of setae, but the under surface crossed lengthwise by an oblique row of setae. Length, 3 to 7 mm.

Distribution.—This species seems largely confined to the Lower Austral Fauna of California and Nevada, extending northward as far as San Francisco. CALIFORNIA: San Diego, 1 ♀, [Acad. Nat. Sci. Phila.]; 1 ♂, May 12, 1913, [Cornell Univ.]. Los Angeles Co., 1 ♀, (D. W. Coquillett), [U. S. Nat. Mus.]; Claremont, in mountains, 1 ♀, (C. F. Baker), [Cornell Univ.]. Palm Springs,

1 ♀, March 24–26, 1918, (J. C. Bradley), [Cornell Univ.]. San Francisco, 9 ♀, July 17, 1903, August 17 and September 18, 1910, (J. C. Bridwell), [U. S. Nat. Mus., 7; Cornell Univ., 2]; Ingleside, San Francisco, 2 ♀, 4 ♂, August 25, 1908, (J. C. Bradley), [Acad. Nat. Sci. Phila., 1 ♀, 1 ♂; Cornell Univ., 1 ♀, 3 ♂]; 1 ♀, September 8, 1910, (J. C. Bridwell), [U. S. Nat. Mus.]. NEVADA: Lyon Co.—Yerington, 8 ♀, June 1909, [Acad. Nat. Sci. Phila., 1; Cornell Univ., 7].

NOTOPLANICEPS new subgenus

Type of subgenus: *Aporus* (*Notoplaniceps*) *fenestralis* new species.

♀. Black with tomentum reflecting blue, in part sericeous. Wings infuscated.

Spatium frontale perpendicular to plane of front or clypeus; antennal fossae oblique, extending but little above level of bases of antennae; inferior margin of antennal sockets somewhat below lower level of eyes; clypeus a short, transverse arcuate band (cf. Haupt's fig. 41,[33] but the conformation is not as exaggerated as in the species there figured); eyes strongly hairy; posterior margin of head from above usually acute, strongly concave, its distance from hind ocelli equal to from one-half of to nearly the diameter of the latter, and to from one-fifth to two-fifths their distance apart; inferior margin of mandibles simple.

Pronotum subequal in length and greatest width, two to two and one-half times as long as mesonotum, its hind margin truncate; the sides of its dorsal surface margined, slightly convergent in front; metapostnotum concealed; mesosternum ending in two laminae divided by a V-shaped median notch.

From femora strongly incrassate; front tibiae with few small spines or none beneath and at apex, the front tarsi without lateral spines; tarsal claws cleft, the inner ray situated near the apical ray from which it is slightly divergent, acute, a little shorter; upper surface of hind tibiae with from few spines to three complete rows. Second recurrent vein opposite or beyond second transverse cubital vein; second submarginal cell trapezoidal, much longer than high.

♂. Characters as given in key.

Distribution.—Neotropical Region, Brazilian Subregion.

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[33] Mitt. Zool. Mus. Berlin, XVI, 1930.

Key to the Species of Notoplaniceps

Females

1 a. Wings lightly infumated, with clear areas or streaks and no coppery reflection 2
b. Wings dark fuscous with a coppery refulgence.....**canescens** Smith
2 a. Posterior margin of mesosternum with two lamellae and a median notch; eyes with long dense hair all over; anterior surface of front femora with copious, erect, black hair, not long, but standing at all angles; width of front femora equal to one-half their length **fenestralis** new species
b. Mesosternum with neither lamellae nor notch; lower surface of eyes more conspicuously hairy than the upper, the hair shorter and much less dense than in *fenestralis;* front femora not obviously hairy, their width equal to about one-third of their length....**innotatus** (Banks)

Males

Wings clouded, clear at base.....**fenestralis** new species
Wings dark fuscous.....**canescens** Smith

Aporus (Notoplaniceps) canescens Smith

1873. *Aporus canescens* Smith, Ann. & Mag. Nat. Hist., (4), XII, p. 53. ♀, ♂. [Brazil.]
1897. *Pompilus canescens* Dalle Torre, Catal. Hymen., VIII, p. 278.

♀. Black, covered with hoary pile, most thinly so on vertex, disc of thorax, and base of abdomen, densest at bases of abdominal tergites. Wings dark with a coppery refulgence.

♂. Smaller and less pilose, the wings dark fuscous.

This species is unknown to me, and its subgeneric or even generic position is doubtful.

Distribution.—BRAZIL: Pará.—Belem, Ega and Santarem.

Aporus (Notoplaniceps) fenestralis new species

1897. *?Planiceps canescens* Fox, Proc. Acad. Nat. Sci., Phila., 1897, p. 263. ♀. [Brazil: Pará.] Misidentification.

♀. Black; sparsely, and obscurely covered with a minute tomentum reflecting blue; the face, sides of body, propodeum and abdomen except apex, tergite 1, base of tergite 2, and extreme base of tergite 3 and legs sparingly covered with minute oppressed sericeous tomentum; front, dorsum, and outer surfaces of front femora and tibiae densely covered with short decumbent and erect brown hair; dorsal surface of propodeum with silky brown tomentum, but no erect hair; eyes densely hairy, the hair long. Calcaria black. Wings infuscated, but not strongly so, an irregular hyaline band crossing the

first submarginal cell before its apex, following along in front of cubital vein across first transverse cubitus, and crossing third discoidal cell; another clear area lengthwise in the median cell behind the subcostal vein; fainter hyaline streaks beyond the second recurrent vein and second transverse cubital veins; basal half of hind wings hyaline.

Vertex sharply margined, the posterior margin strongly concave, distant from hind ocelli by one-half diameter of latter and by one-fifth distance of these apart. Scape broad, flattened, but not carinate, not bent, covered with short hair, the proportions of first four segments of antennae as 28:5:22:24.

Streptaulus paralleling upper margin of side of pronotum, but disappearing at middle of lateral surface, a short oblique groove remaining in front of tubercles. Four or five short stout spines along posterior margin of under surface of front tibiae, the last of these being along the edge of the V-shaped apical emargination, no apical spines on front tibiae; the front metatarsus with three median spines underneath, no other noticeable tarsal spines; hind tibiae with three complete rows of rather long spines, and the metatarsus strongly spinose; longer hind tibiae spur three-fifths length of metatarsus. Length, 8.5 mm.

♂. Black, thinly covered with fine white pubescence, which in certain lights appears brownish, and that on dorsum shows little white. Calcaria black. Wings clouded, clear at base.

Profile of head evenly convex to the very sharp hind margin; in front view the upper margin strongly convex, continuous in curve with outer orbits; the posterior surface entirely flat or a little concave and glabrous; vertex with a low median tubercle; ocellar measurements: a 4, b 3, c 12, d 14.

Front claws asymmetrical; other claws curved, with an erect inner tooth; longer hind tibial spur as long as metatarsus. Second recurrent vein just barely beyond second transverse cubitus.

Last sternite liguliform, obtusely rounded at apex, with a weak median carina at base beneath, in profile a little wider at base and tapering in a curve to apex. Parameres long and very slender, bent at middle, extending about one-half their length beyond apex of parapenial lobes, with sparse long bristles on outer interior margin; volsellae parallel-sided, short, straight, obtuse, with long setae on lower margin; aedeagus short, pointed; apical lamina of parapenial lobes in profile longer than wide. Length, 4.8 mm.

The sharply margined head makes it fairly certain that this is the male of *fenestralis*. It is quite possible that *Dryinus auripennis* Fabricius is this or a related species.

Holotype.—Female, Muzo, Boyaca, Colombia, 900 m. alt., 1936, (J. Bequaert), [Mus. Comp. Zool.].

Allotype.—Male, Vista Nieve, San Lorenzo Mt., Magdalena, Colombia, December 18, 1922, (J. Bequaert), [Mus. Comp. Zool.].

Paratypes.—1 ♂, Cerro Patron, Rio Frio, Colombia, September 12, 1927, (G. Salt), [Cornell Univ.]. 1 ♂, Mayaro Bay, Trinidad,

September 24, 1934, (N. A. Weber), [Mus. Comp. Zool.]. 1 ♀, Santarem, Pará, Brazil, (H. H. Smith), [Carnegie Mus.].[34] 2 ♂, Campinas, São Paulo, Brazil, February 1937, (E. J. Hambleton), [Acad. Nat. Sci. Phila.; U. S. Nat. Mus.].

Aporus (Notoplaniceps) innotatus (Banks) new combination

1925. *Planiceps innotatus* Banks, Bull. Mus. Comp. Zool., LXVII, p. 337. ♀. [Canal Zone.]

♀. Black; tomentum without blue or green reflection, cinereous on lateral surfaces, legs, and antennal fossae, also more or less so on front and vertex which have copious sub-erect dark hair, dorsal surface with dark tomentum, without noticeable erect hair except on tergites where it is copious; calcaria black. Wings smoky, especially the fore wings, these with a vaguely indicated subhyaline band below stigma and area in median cell.

From in front the upper margin of the vertex convex, medially somewhat above the upper limits of the eyes and not strictly continuous with their outline; from above the hind margin is strongly and evenly concave, marked by a strong, but not acute, ridge; posterior surface of head concave, much higher medially than distance between hind ocelli; head measurements: a 15, b 17, c 8, d 8, e 11, f 12, g 4, h 2, i 8; ocellar measurements: a 2, b 4, c 6, d 8; clypeus short, curved; eyes hairy, especially on the lower part.

Dorsal measurements: a 8, b 12, c 6; sides of pronotum parallel, slightly rounded at humeri, the margins barely indicated, without distinct ridges; streptaulus not sharp, extending to middle of lateral surface of pronotum, a large part of which is occupied by a triangular depression extending to the spiracular tubercle; front coxae extending well toward apex of mesosternum, which has neither laminae nor notch, but rounds apically into a vertical surface which joins it with the metasternum. Front femora moderately incrassate, about one-third as wide as long; hind margin of under surface of front tibiae with two spines, the second of which is in the articulatory emargination, apex with two minute spinules; segments of front tarsi not obviously spinose laterally; claws bifid; hind tibiae with three rows of spines, some of which are longer than the diameter of the tibiae; longer hind tibial spur three-fifths as long as metatarsus. Length, 4.5 mm.[35]

Distribution.—CANAL ZONE: Barro Colorado Island, 1 ♀, July 19, 1924, (N. Banks), [*holotype*, Mus. Comp. Zool.].

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[34] This is the material determined by Fox with a query as *canescens* Smith.
[35] Description taken from the type.

NEOPLANICEPS new subgenus

Type of subgenus: *Planiceps tarsalis* Ashmead.

♀. Claws with an erect tooth on inner margin, remote from apex, as in *Aporus*. Abdomen or legs red, and with or without minute tomentum with a violet or blue sheen. In other respects similar to *Notoplaniceps*.

♂. Characters as given in the key.

Distribution.—Neotropical Region, Antillean Subregion.

Key to the Species of Neoplaniceps

Females

Legs largely red; body black with obscure purplish sheen; wings brown with little reflection.....**tarsalis** (Ashmead)
Legs black; abdomen red except at apex, remainder of body black without metallic sheen; wings brilliantly bronze and purple **prolixus** new species

Males

Femora reddish yellow.....**tarsalis** (Ashmead)
Legs entirely black.....**cariborum** new species

Aporus (Neoplaniceps) tarsalis (Ashmead) new combination
(Pl. IV, fig. 18.)

1900. *Planiceps tarsalis* Ashmead, Trans. Ent. Soc. London, 1900, p. 231. ♂, ♀. [Grenada & St. Vincent.]

♀. Dull black, the legs except middle and hind coxae clear ferruginous red, the tarsi brown, apex of mandible ferruginous. Body overlaid with a very minute tomentum that gives sparingly a blue and violet sheen, largely obscured on the lateral parts by a minute cinereous and sericeous pile, and on the front and dorsum by an abundant decumbent brownish pubescence and scattered, longer, erect, black hairs; the front femora and tibiae not noticeably pubescent, although bearing a minute yellowish tomentum and fine, scattered, erect hairs. Fore wings almost uniformly brown, with obscure reflection; the hind wings paler; veins and setae brown, the latter dense but not exceptionally long.

Clypeus a short transverse, arcuate band; spatium frontale compressed and prominent; posterior margin of head from above concave, not angulate, its distance from hind ocelli about equal to the diameter of the latter or twice their distance apart. Antennal measurements: 30:8:18:21.

Dorsal measurements: a 25, b 23, c 12; dorsal surface strongly margined laterally; streptaulus becoming obsolete on anterior part of lateral surface, a short longitudinal groove in front of spiracular tubercle. Two short spines along posterior margin of under surface of front tibiae before the

articulatory emargination, a row of four along the margin of the latter; no spines at apex, a row of seven short, but very stout, acute spines along posterior margin of metatarsus but the tarsi without other noticeable spines; upper surface of hind tibiae with two rows of slender spines; hind metatarsus rather finely spinose; longer spur of hind tarsus one-half the length of metatarsus. Length, 10 mm.

♂. Black, all femora reddish yellow (mikado orange); the tibiae and tarsi brown; pubescence white, strongly silvery on face and propodeum. Wings hyaline, the anterior pair stained slightly brownish.

Ocellar measurements: a 4, b 5, c 9, d 8. Both claws of each front pair strongly curved, the anterior one the more so and with a rounded basal lobe, the posterior one with the inner ray forming an obliquely truncate tooth; other claws less curved and with a normal tooth at middle; longer spur of hind tibiae two-thirds as long as metatarsus.

Last sternite slender, liguliform, not compressed, without carina beneath. The phallus is shown on plate IV, fig. 18. Parameres extending about one-third their length beyond parapenial lobes, very slender, slightly bent at middle, the apical part almost filiform, the inferior margin with about a dozen long, stout bristles; volsellae slender, strap-like, with about eight bristles on the inferior margin; aedeagus stout at base, tapering to a pointed apex; apical laminae of parapenial lobes in profile short and rounded. Length, 5 mm.

Description prepared from what are presumed to be female and male paratypes, the female labelled with the specific name in Ashmead's handwriting, in the U. S. National Museum. No locality data is recorded on the labels.

Distribution.—GRENADA: St. Vincent.

Aporus (Neoplaniceps) prolixus new species

♀. Black, the abdomen except tergite 6 and apex of 5 and sternites 3 to 6 red; apex of mandibles ferruginous. Violet reflection from tomentum present but much obscured; antennal fossae, sides and propodeum with some silvery pile; front and dorsum with dense, short, recumbent, brownish pubescence; and scattered short erect hairs; outer surface of front femora and tibiae with short almost woolly pubescence; dorsal surface of propodeum without erect hair. Fore wings uniformly dark brown, with strong coppery lustre, which in certain lights gives a brilliant almost golden refulgence, at apex violet; hind wings subhyaline, brownish toward apex; veins and setae brown, the latter dense but not unusually long.

Clypeus a transverse arcuate band; spatium frontale less compressed and not so prominent as in *tarsalis;* hind margin of head concave, sharper than in *tarsalis,* distant from hind ocelli by about four-fifths the diameter of the latter or one-third their distance apart. Antennal measurements: 30:8:18:20.

Dorsal measurements: a 22, b 25, c 14; lateral margins of dorsal surface of pronotum well developed; streptaulus parallel to dorsal margins of lateral surface of pronotum, extending for less than one-half their length; a small but not linear depression in front of spiracular tubercle. Spines on front tibiae rudimentary, those on metatarsus very short and concealed by hair; spines of hind legs as in *tarsalis;* longer spur of hind tarsus one-half the length of the metatarsus. Length, 10 mm.

Holotype.—Female, Christiansted, St. Croix, Virgin Islands, 1940, (H. A. Beatty), [U. S. Nat. Mus.].

Aporus (Neoplaniceps) cariborum new species

1900. *Planiceps euferalis* Ashmead (nec Fox), Trans. Ent. Soc. London, 1900, p. 231. ♂. [St. Vincent.] Misidentification.

♂. Black to dark brown, tips of mandibles ferruginous; calcaria dark; pubescence whitish. Wings subhyaline, evenly stained a little brownish, strongly irridescent.

Posterior margin of vertex rounding, with bare indication of a ridge; ocellar measurements: a 3, b 4, c 6, d 7; posterior surface of head pubescent, rounding and convex to an arc which evidently represents the occipital carina although no carina is evident, and below this concave and glabrous.

Propodeum without median dorsal furrow. Front tarsal claws asymmetrical, but the apical ray of each strongly curved, the posterior claw of the pair almost cleft; other tarsal claws with a small tooth on inner margin. Longer hind tibial spur three-quarters as long as metatarsus. Second recurrent vein opposite second transverse cubitus.

Last sternite long, slender, liguliform, obtusely pointed, weakly carinate in center beneath, in profile very slender, the inferior outline slightly curved. Phallus as described for *tarsalis* Ashmead. Length, 3.5 to 5 mm.[36]

The males of these Aporini are, many of them, so similar in appearance, and the species seem to be so closely restricted geographically in the Antilles, that it is highly improbable that this species is identical with *euferalis* Fox from Jamaica; it disagrees in certain of the few characters given by Fox that do not apply to all species.

Holotype.—Male, St. Vincent, West Indies, 500 ft. alt., (H. H. Smith), [U. S. Nat. Mus.].

Paratypes.—5 ♂, same data as from type.

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[36] The description is drawn from the holotype, which is the only specimen that I have seen.

PLANICEPS Latreille

Pompilus auctt.

1825. *Planiceps* Latreille, Fam. Règne Anim., p. 456.

1930. *Planiceps,* subg. of *Aporus* Haupt, Mitt. Zool, Mus. Berlin, XVI, p. 737.

♀. Front very long, the antennal sockets entirely or almost entirely below the lowermost level of the eyes; clypeus a very short arcuate strip (see Haupt's fig. 41 [87]); antennal fossae extending but little above bases of antennae, spatium frontale perpendicular, the area frontalis elevated very far above plane of clypeus; mandibles with a strong acute tooth on outer part of lower margin; eyes strongly hairy, long and narrow, no malar space. Antennae set close together, the scape broad, somewhat compressed, not curved. Pronotum comparatively short; metapostnotum very short, sunken medially, not striate. Front femora strongly incrassate; tarsal claws with an erect tooth beneath. Second submarginal cell much longer than high; second recurrent vein slightly beyond second transverse cubitus.

The description is based upon our Cuban species and may not in all respects cover the European *P. planiceps* Latreille, which I have not seen. In all probability the latter does not have hairy eyes, and on this and possibly other reasons it may be necessary eventually to separate the Cuban species subgenerically from the European one.

Distribution.—Palearctic Region: Mediterranean Subregion. Neotropical Region: Greater Antilles.

Planiceps antillarum new species

♀. Black, except the following parts red: spot at middle of front of pronotum, crossing streptaulus, band along posterior margin of pronotum, and entire abdomen. Tomentum without bluish reflection, mostly thin and inconspicuous, dark on dorsal areas and most of body and legs, but silvery on antennal fossae, clypeus, more or less on front, apex of propodeum, and some small pleural areas. Front rather densely covered with short erect black hair, turned toward many directions so that it has a woolly appearance, similar hair on anterior surface of front femora, but the pleura and propodeum with little or no erect hair; calcaria black. Wings bronze, with golden bronze reflection.

Seen from in front the upper margin of the vertex almost truncate at the level of the tops of the eyes, from above the hind margin concave, rounding into the posterior face without a sharp ridge; antennal sockets at the level of the lower margins of the eyes, but not completely below that level; head measurements: a 23, b 27, c 11, d 13, e 16, f 18, g 5, h 2, i 13; ocellar measurements: a 4, b 5, c 10, d 10. Antennal measurements: 9:2:6:7, width of scape: 4.

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[87] Mitt. Zool. Mus. Berlin, XVI, 1930.

Dorsal measurements: a 18, b 22, c 10; dorsal surface of pronotum nearly flat, decurved anteriorly, the collar short, flat, but little below the level of the dorsum, and in a parallel plane, sides of dorsal surface of pronotum a little convergent anteriorly, rounding at the humeri, the margins indicated by a rounded ridge, stronger posteriorly; streptaulus distinct, but not deep, across the collar, deep but not sharp at humeri, resolving into a broad and widening basin on lateral surface behind humeri; mesosternum terminating in two laminae, with a rounded notch between. Front femora slightly over one-half as wide as long; hind margin of under surface of front tibiae with a stout spine in articulatory emargination, no apical spines and none on sides of tarsal segments; upper surface of hind tibiae with three rows of spines, much shorter than the diameter of the somewhat thickened tibiae; longer hind tibial spur about three-fifths as long as metartarsus; apical ray of claw long and slender, the tooth at middle short and acute. Length, 8 to 9 mm.

This species closely resembles in color both *Drepanaporus collaris* and *Odontaporus simulatrix*.

Distribution.—HAITI: Port-au-Prince or vicinity, 1 ♀, October 2, 1934, (P. J. Darlington, Jr.), [*holotype,* Mus. Comp. Zool.]. CUBA: Oriente.—Mts. north of Imias, 1 ♀, 3,000 to 4,000 ft. alt., July 25–28, 1936, (P. J. Darlington, Jr.), [*paratype,* Mus. Comp. Zool.].

COSMIAPORUS new genus

Type of genus: *Planiceps diverticulus* Fox.

♀. Lower margin of antennal sockets not above base of eyes; clypeal suture arcuate; clypeus short; inferior margin of mandibles with a low broad denticle, but little more than an angle; claws (Plate IV, fig. 30) bifid, the outer ray bent at an angle, and from that point long, straight and slender, the inner ray scarcely if any wider, long, obliquely truncate; eyes very slightly approaching one another on vertex, hind ocelli twice their diameter from hind margin of head.

Distribution.—Neotropical Region, Brazilian Subregion.

Cosmiaporus diverticulus (Fox) new combination (Pl. IV, fig. 30.)

1897. *Planiceps diverticulus* Fox, Proc. Acad. Nat. Sci., Phila., 1897, p. 262. ♀. [Brazil: Matto Grosso.]

♀. Entirely black; the minute tomentum with a blue reflection, not strong, the lower front, the body beneath, the legs, and to some extent the sides showing grey in favorable lights, or in places brown; head with some short erect hairs, pronotum, pleura, propodeum, femora and tibiae devoid of these. Wings deeply infuscated, with a dull violaceous lustre.

Head measurements: a 36, b 36, c 32, d 22 (above base of antennae), e 26, f 25, h 6, i 22; posterior margin of head truncate, forming a ridge; ocelli small; ocellar measurements: a 10, b 4, c 23, d 22. Antennal measurements: 11:3:9:8.

Dorsal measurements: a 31, b 35, c 23; dorsal surface of pronotum weakly margined laterally; streptaulus not impressed behind shoulders, scarcely any depression in front of spiracular tubercle; metapostnotum concealed; mesosternal lobes rounded with a slit between them. Breadth of front femora to length as 12:33; posterior border of under surface of front tibiae with two spines, the second in the articulatory emargination, only minute spinules at apex; longer hind tibial spur one-half as long as metatarsus; if viewed from beneath instead of the side the rays of the claws a little bent out of a straight line. Length, 16.5 mm.[38]

Distribution.—BRAZIL: Matto Grosso.—Chapadá, 2 ♀♀, April and September, (types, Carnegie Mus.).

DREPANAPORUS new genus

Type of genus: *Planiceps collaris* Cresson.

♀. Lower margins of antennal sockets well above the lower level of the eyes; clypeal suture and clypeus transverse, the latter comparatively long; inferior margin of mandibles with an erect, acute tooth; eyes turning in on vertex; hind ocelli not more than their diameter from hind margin of head. Claws bifid, the inner ray broad and obliquely truncate.

♂. Characters as stated in key and under description of *D. collaris.*

Distribution.—Neotropical Region, Antillean Subregion.

Drepanaporus collaris (Cresson) (Pl. IV, figs. 4, 8, 16 and 23.)

1865. *Planiceps collaris* Cresson, Proc. Ent. Soc. Phila., IV, p. 132. ♀. [Cuba.]

1867. *Planiceps cubensis* Cresson, Trans. Amer. Ent. Soc., I, p. 136. ♂. [Cuba.]

1897. *Pompilus falco* Dalle Torre, Catal. Hymen., VIII, p. 288.

1897. *Pompilus troglodytes* Dalle Torre, Catal. Hymen., VIII, p. 328.

1928. *Planiceps collaris* Banks. Studies on Cuban insects. 1. Notes on Cuban and other West Indian Psammocharidae, p. 9. ♀.

♀. Differs from *Odontaporus simulatrix* in the following respects: tomentum of front and pronotum black, with a purplish sheen; front tibiae and propodeum without erect hair; antennal fossae and apex of propodeum with cinereous pubescence; a weak oblique groove in front of spiracular tubercle; claws bifid, the inner ray fairly close to and parallel with the outer ray, broad and obliquely truncate; two spines of a median row on hind tibiae.

[38] The description has been drawn from the specimen bearing the species-label with the word "type" in Fox's handwriting.

♂. Black, a narrow ivory band extending across the dorsal surface of the pronotum, close to the posterior margin; pubescence entirely white; wings hyaline at base, the apical half or a little more lightly infuscated and with golden reflection.

Ocellar measurements: a 5, b 5, c 12, d 12. Front claws asymmetrical, the outer ray of the anterior claw more curved, the basal lobe longer and more rounded than those of the posterior; other claws toothed; longer hind tibial spur three-quarters as long as metatarsus.

Last sternite (Plate IV, fig. 4) tongue-shaped, slender, obtuse, its dorsal surface nearly flat, the under surface tectiform, with sloping sides and a slight keel, in profile (Plate IV, fig. 8) the under outline curved. Parameres (Plate IV, fig. 23) in lateral view broadened strongly from base to middle, where they are suddenly obliquely narrowed, and have an apical slender appendage, extending well beyond parapenial lobes, setose on upper surface; volsellae (Plate IV, fig. 16) of irregular shape, tapering, flattened dorsoventrally, their apices hooked mesad, their outer surface sparingly setose; cuspis volsellaris thorn-like, hooked; apical lamina of parapenial lobes long; aedeagus slender, flattened, acuminate, shorter than parapenial lobes. Length, 6.5 mm.[39]

This species closely resembles both *Planiceps antillarum* and *Odontaporus simulatrix* in color, the three species exhibiting what I have previously referred to as the Antillean type of coloration.

Distribution.—CUBA: Buenos Aires, 1 ♂, May 8–14, 1936, (P. J. Darlington, Jr.), [Mus. Comp. Zool.]. Oriente.—Mts. North of Imias, 1 ♀, 3,000–4,000 ft., July 28, 1936, (P. J. Darlington, Jr.), [Mus. Comp. Zool.]. Pico Turquino, south side, 2 ♀, 3,000–5,000 ft., June 1936, (P. J. Darlington, Jr.), [Mus. Comp. Zool.].

ODONTAPORUS new genus

?1902. *Melanaporus* Ashmead, Can. Ent., XXXIV, p. 132.

Type of genus: The species which I here identify as *Planiceps notabilis* Smith as represented by a male from Santa Ana, Costa Rica in the collection of the Academy of Natural Sciences of Philadelphia. In case this species proves not to be *notabilis,* it and not *notabilis* Smith shall stand as genotype.

♀. Black or more or less yellow or red. Wings black or banded.

Lower margins of antennal sockets a little above base of eyes, and slightly removed from base of clypeus, which is transverse, but not an arcuate band;

[39] Description of male drawn from a specimen in the Museum of Comparative Zoology of Harvard University. I have not seen the type of *cubensis* Cresson, which is in the Gundlach Collection.

inferior margin of mandibles interrupted by a notch and an erect tooth, or by merely a long acute tooth, as in *Planiceps;* claws with an acute tooth; eyes bare.

♂. Black, or tergites spotted; pubescence at least in large part sericeous. Wings brownish throughout or hyaline with fuscous apex.

Anterior tarsal claws asymmetrical; second recurrent vein situated apicad of second transverse cubital vein. Last sternite (Plate IV, fig. 5) slender, liguliform, nearly flat. Parameres (Plate IV, fig. 17) short, slender, parallel-sided and truncate; volsellae spoon-shaped.

I have little doubt but that the name *Melanaporus* will eventually have to replace *Odontaporus,* for I think that it will be found that its type species, *Planiceps euferalis* Fox, is the male of *cupripennis* Banks, since these are the only species of the tribe known from Jamaica.

Distribution.—Neotropical Region, Mexican and Antillean Subregions.

Key to the Species of Odontaporus

Females

1 a. Wings banded.....4
b. Wings uniformly dark.....2
2 a. Abdomen not spotted. [Antillean].....3
b. Tergites 2 and 3 with lateral yellow spots and 6 with a median basal yellow spot. [Central American].....**notabilis** (Smith)
3 a. Integument entirely black.....**cupripennis** (Banks)
b. Abdomen red, pronotum marked with red.....**simulatrix** new species
4 a. Fifth tergite yellow; distance between hind ocelli and posterior margin of head equal to one and two-thirds times their diameter **aureolus** new species
b. Fifth tergite black; above distance equal to four-fifths diameter of ocelli **comptus** new species

Males

Tergites 2 and 3 spotted. [Mexico to Costa Rica].....**notabilis** (Smith)
Entirely black. [Jamaica].....**euferalis** (Fox)

Odontaporus cupripennis (Banks) new combination

1928. *Planiceps cupripennis* Banks. Studies on Cuban insects. 1. Notes on Cuban and other West Indian Psammocharidae, p. 9. ♀. [Jamaica.]

♀. Black, the tomentum giving the upper part of front, dorsum, wings and abdomen a strong coppery lustre, giving way to purple, blue, and violet on the sides, legs, and apical part of the abdomen; front, dorsum and forelegs without decumbent pubescence, but front, dorsum and outer surface of

front femora have sparse erect hair; propodeum without erect hair. Wings uniformly dark, with strong coppery lustre, burnished, the veins and setae brown, the latter dense but not unusually long.

Eyes strongly incurved above; clypeus subtruncate; mandibles broad, flat, the inner margin with two small close-set acute teeth, the inferior margin with a notch preceded by an acute incurved tooth; hind margin of head concave, distant from hind ocelli by about the diameter of the latter, five-twelfths their distance apart, these equidistant from eyes and each other. Antennal measurements: 30:8:18:18.

Dorsal measurements: a 23, b 28, c 15, lateral margins of dorsal surface of pronotum distinct; streptaulus present on anterior one-third of lateral surface of pronotum, no groove in front of spiracular tubercles. Under surface of front tibiae with two rather long slender spines, one of these on margin of articulary incision, the spines at apex very short and stout, not noticeable; a few very short stout spines on posterior edge of metatarsus and a median row of flattened spines underneath; upper surface of hind tibiae with two sparse rows of slender spines, and hind metatarsi sparsely spinose; longer hind tibial spur two-fifths length of metatarsus. Length, 11 mm.[40]

If this species is the female of *euferalis* Fox, as seems most probable, the latter name will replace *cupripennis*.

Distribution.—JAMAICA: Chinchona, 1 ♀, alt. 5,000 ft. [Mus. Comp. Zool., *type*]. Blue Mts. between Pleasant Hill and St. Helen's Gap, in forest, alt. 4,400–4,780 ft., 1 ♀, July 27, 1923, [Acad. Nat. Sci. Phila.].

Odontaporus euferalis (Fox) new combination

1891. *Planiceps euferalis* Fox, Trans. Amer. Ent. Soc., XVIII, p. 341. ♂. [Jamaica.]
1897. *Pompilus euferalis* Dalle Torre, Catal. Hymen., VIII, p. 287.
1902. *Melanaporus euferatis* (*sic!*) Ashmead, Can. Ent., XXXIV, p. 132.

♂. Black; pubescence silvery sericeous, more dense on face, anterior and posterior coxae and the propodeum, a basal band on tergites 2 to 4. Wings hyaline, irridescent, apical margin of the anterior pair fuscous.

Propodeum strongly furrowed above.[41]

Distribution.—JAMAICA: Port Antonio.

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[40] Described from a paratype in the Museum of Comparative Zoology.

[41] I have not seen a specimen of this species, of which the preceding is probably the female. Dalle Torre incorrectly recorded the locality as Indiana.

Odontaporus simulatrix new species

♀. Black, all tergites and base of first sternite red; apex of mandibles ferruginous; posterior margin of pronotum and an anterior transverse spot dull red; tergites showing in certain lights a violet reflection which does not arise from tomentum; tomentum of body not casting bright or purple reflection, but on front, sides and legs there is a dull bronzed purplish sheen, on dorsum golden bronze; front, dorsum, front femora, and tibiae with sparse erect black hair but no decumbent pubescence (other than the fine silky tomentum); dorsal surface of propodeum with a few fine erect hairs at sides. Fore wings dark, bronzed and burnished; hind wings subhyaline, dark toward apex; wing-veins and setae brown, the latter dense but not long.

Clypeus rounded, almost subtruncate; mandibles broad and flattened, the inner margin with a single stout blunt tooth at apical one-third, the outer, in same position, with a notch preceded by a long incurved spike-like tooth, much longer than in *cupripennis;* eyes strongly incurved above; the hind margin of head from above concave, distant from hind ocelli by barely less than the diameter of the latter which is equal to one-half of their distance from each other or from the eyes.

Dorsal measurements: a 23, b 31, c 17; streptaulus confined to anterior one-third, no groove in front of spiracular tubercle. Front femora three-sevenths as wide as long; under surface of front tibia with three spines, the apical one longer than the others and on the margin of the articular emargination; no spines at apex of tibia; five minute spines along hind edge of metatarsus and a median row of flattened spines underneath; two rows of rather long spines on upper surface of hind tibiae and only the apical spine of an intermediate row; hind metatarsi strongly spinose; claws with an erect acute tooth, remote from apical ray; longer spur of hind tibiae one-half the length of the metatarsus. Second recurrent vein ending well beyond second transverse cubitus. Length, 12 mm.

This species is similar in color and appearance to *Drepanaporus collaris* and *Planiceps antillarum.*

Holotype.—Female, Jayuya, Pichaco Mt., Areciba, Puerto Rico, July 25, 1932, (R. G. Oakley), [U. S. Nat. Mus.].

Paratypes.—1 ♀, Jaronu, Cuba, May 27, 1931, (L. C. Scaramuzza), [Mus. Comp. Zool.]. 1 ♀, Soledad, Las Villas, Cuba, February 16, 1925, (G. Salt), [Mus. Comp. Zool.]. 1 ♀, San Blas or vicinity, Trinidad Mts., Cuba, April 24, (G. E. Folk), [Mus. Comp. Zool.].

Odontaporus notabilis (Smith) new combination (Pl. IV, figs. 5 and 17.)

1860. *Planiceps notabilis* Smith, Journ. of Ent., I, p. 80. ♀. [Mexico.]
1893. *Pompilus* (*Planiceps*) *notabilis* Cameron, Biol. Centr.-Amer., Hymen., II, p. 186.
1897. *Pompilus notabilis* Dalle Torre, Catal. Hymen., VIII, p. 307.

♀. Black, tergites 2 and 3 with a large yellow spot on each side, tergite 6 with a median basal yellow spot; apex of mandibles and claws ferruginous. Without blue sheen, but with a silky lustre due to a fine tomentum, brown dorsally and on front, cinereous but inconspicuous on antennal fossae, sides of propodeum and legs. Wings uniform, dull, brown, with scarcely any reflection, the hind wings paler only at base; veins and setae brown, the latter dense but not long.

Clypeus subtruncate apically, rounding at sides; mandibles slender, the inner margin with a small tooth at apical third (perhaps worn); the inferior margin with a notch and small, acute, decurved tooth at corresponding location; eyes incurved above, but less strongly than in the preceding species, the face longer; hind margin of head from above concave, its distance from the hind ocelli equal to about one-half the diameter of the latter, or to about one-sixth of their distance apart or from the eyes.

Dorsal measurements as 1:1:½; lateral margins of dorsal surface of pronotum distinct; streptaulus distinct only on anterior third of lateral surface; a weak longitudinal groove in front of spiracular tubercle. Front femora .45 as wide as long; front tibiae without spines at apex, with one small spine underneath located on margin of articular emargination; front metatarsus without lateral spines, the flattened median row of spines feeble; upper surface of hind tibiae with two rows of strong spines and the apical two spines of a median row; hind metatarsi spinose; longer hind tibial spur .45 of length of metatarsus. Length, 13 mm.

♂. Colored much like female, black, a narrow ivory band close to posterior margin of dorsal surface of pronotum, extending laterally to spiracular tubercles, an ivory spot on each side of tergites 2 and 3, and an ivory stripe on upper surface of hind tibiae beyond the base; pubescence white, brownish on dorsum. Wing lightly infuscated throughout, brownish.

Frontal fissure represented by a strong pit in center of front; posterior margin of head, seen from in front, a little convex, slightly interrupting what would be the continued outline of the upper margins of the eyes, the hind margin rounded, with a trace of a ridge, the hind surface pubescent and convex for a short distance to the distinct occipital carina, below which it is smooth and concave; vertex prominent between ocelli; ocellar measurements: a 8, b 4.5, c 11, d 8.

Front claws asymmetrical, the anterior claw of front pair with outer ray curved, long, the inner ray a tapered and obliquely truncate long tooth; the posterior claw of front pair with outer ray short and curved, the inner ray a short acute tooth; other claws missing in the allotype; longer hind tibial spur

.8 as long as metatarsus. Second recurrent vein situated beyond the second transverse cubital vein.

Last sternite (Plate IV, fig. 5) nearly flat, not carinate in middle beneath, in dorsal view slender, tapered and obtusely pointed, in profile not thickened.

Phallus as shown on Plate IV, fig. 17; parameres considerably shorter than parapenial lobes, parallel-sided, obliquely truncate; the inferior margin with a few fine setae; volsellae, seen from above, spoon-shaped, with fine, short setae beneath; cuspis volsellaris stout, hooked at apex; apical lamina of parapenial lobes in profile short and wide. Length, 7 mm.[42]

Distribution.—MEXICO: type series. GUATEMALA: Puerto Barrios, 1 ♀, March 3, 1914, (Jas. S. Hine), [Mus. Comp. Zool.]. COSTA RICA: Santa Ana, 1 ♂, (F. Tristán), [*allotype,* Acad. Nat. Sci. Phila.].

Odontaporus aureolus new species

♀. Black, a large spot on each side of tergite 2, and tergites 4 and 5 entirely, dull yellow; apex of mandibles and claws ferruginous. Pile without blue or violet sheen, long, matted and dense on head and dorsum, that on entire front surface of head, scape, on posterior third of pronotum and on mesonotum yellow, as is also shorter, scantier tomentum on tergites 4 and 5, that of anterior part of pronotum black; pubescence of sides, propodeum, legs and underparts more or less cinereous and sericeous, more strongly cinereous under legs and body. Wings hyaline except for 2 broad sharply defined fuscous bands, 1 along basal vein, base of first and most of second discoidal cells, the other involving entire marginal cell and crossing obliquely behind it, leaving the apex clear; setae of wings long and dense, becoming more or less matted white tomentum on the pale areas except the apical one.

Anterior margin of clypeus more pronouncedly truncate than in preceding species; slightly emarginate mesally, rounding laterally; mandibles broad, the inner margin with two teeth at apical third, the inferior margin with a notch and acute, incurved, erect tooth at same position; eyes but slightly incurved above; hind margin of head from above truncate, distant from hind ocelli by one and two-thirds times the diameter of latter, the diameter being equal to one-third of their distance apart or from the eyes.

Dorsal measurements: a 25, b 31, c 13; sides of dorsal surface of pronotum distinctly margined; streptaulus distinct only at extreme front of lateral surface, only a slight, not linear, depression in front of spiracular tubercles. Front femora three-sevenths as wide as long; front tibiae with a row of three or four slender spines along posterior border of under surface, one or two of which are along border of articulatory emargination; a row of three minute stubby spines, paralleling and close to these on outer sides, continuous with an apical border of short, stout, claw-like spines; five short, slender spines along posterior side of front metatarsus, and the usual median row

[42] I have not seen the type, which is a female.

underneath; upper surface of hind tibia with 2 rows of 4 spines each, the metatarsus sparingly spinose; longer hind tibial spur a scant half the length of the metatarsus. Length, 12 mm.

Holotype.—Female, Jilotepec, San Rafael, Mexico, [U. S. Nat. Mus.].

Odontaporus comptus new species

♀. Differs from preceding in following characters: Tergite 5 black, not yellow; pile of antennal fossae and of clypeus cinereous, that of scape short and inconspicuous, appearing yellowish, like that of flagellum, only in a favorable light; cinereous pile equally conspicuous on sides, propodeum and underparts; whitish tomentum of wings less developed; tooth under mandibles shorter; eyes more strongly incurved above, the face not as long; hind margin of head concave, nearer to ocelli, being distant from hind ocelli by four-fifths diameter of latter; dorsal measurements: a 25, b 28, c 12; row of spines under front tibiae not paralleled by a row of shorter spines but continuous with apical series; more spines in each row on hind tibiae. Length, 10 mm.

Holotype.—Female, Cabina, Panama, May 21, 1917, (A. Busck), [U. S. Nat. Mus.].

CHELAPORUS new genus

Type of genus: *Pedinaspis anomala* Banks.

♀. Head seen from in front longer than broad; eyes narrow, slightly narrowing below, not reaching the summit and distant from the hind margin by more than twice the length of the pedicel; antennal sockets just above level of bottom of eyes, very narrowly separated; antennal fossae extending obliquely upwards a short distance, but evanescent in less than one-third of the distance to the level of the lower ocellus, the spatium frontale between them strongly and roundingly elevated, not flat, dropping perpendicularly between the antennae to the area frontalis; antennal fossae continuous across face below antennae, there being no dividing ridge between them, but linear, the clypeal suture stretching across the face very close to the antennal sockets; clypeus transverse, more than twice as broad as its median length, sloping slightly upward across its entire breadth from base, its lateral margins oblique, its apex broadly and shallowly emarginate, its surface not far from flat; no frontal fissure nor pit; hind ocelli about equidistant from eyes, from hind margin of head and from one another; upper outline of head, as seen from in front rounded at sides, nearly straight in center; hind margin of head, from above truncate; no mandibular space medially, but a little space left at posterior condyle; under margin of mandibles without a tooth. Antennae short, the scape neither compressed nor noticeably curved.

Pronotum longer than wide, but not as long as *Euplaniceps*, the sides of the dorsal surface convergent anteriorly, margined by a slight rounded rim; the dorsal surface of pronotum in profile slightly downcurved medially to the collar; streptaulus indistinct across middle of collar, extending laterally well back on the lateral face of pronotum, but not turned upwards; a small pit before spiracular tubercle; metapostnotum visible in a depression as merely a transverse line; lower border of mesopleura without tubercle or angle at side of coxae; posterior margin of lower surface of mesosternum not notched nor lobed. Propodeum with evenly rounded contours, the hind angles slightly prominent, but rounded, dorsal face horizontal and posterior face steeply oblique; no tubercles in front of spiracles. Abdomen slender and compressed.

Front femora compressed, moderately incrassate; front tibiae projecting well beyond the insertion of the tarsus; the apex above armed with two stout decurved claws, the longer of which is as long as the basal width of the metatarsus; the strigil inserted more than one-third of the way to the base of the tibia, and the posterior inferior margin along this articulating surface bordered with three small and two longer teeth or spurs, the row ending in the shorter of the two apical claws above referred to; no tarsal comb, and only small spines on the front tarsal segments; upper surface of hind femora without spines; upper surface of hind tibiae also devoid of spines (1 small spine exists on one leg of type); apex of hind tibiae with few short spines; last hind tarsal segment with only apical spines underneath; tarsal claws with a small acute nearly perpendicular inner tooth, the outer ray slender and not strongly bent. Two submarginal cells, the second trapezoidal, the first and second transverse cubital veins distant along the marginal vein by nearly the length of the first transverse cubital vein; third discoidal cell longer than high, the second recurrent vein received by the second submarginal cell well before the second transverse cubital vein; basal vein of fore wing strongly bent; transverse median vein opposite basal vein in fore wing, basad of cubital vein in hind wing.

♂. Characters as given in key and under *C. anomalus*.

Chelaporus anomalus (Banks) new combination

(Pl. IV, figs. 6 and 9–11.)

1917. *Pedinaspis anomala* Banks, Bull. Mus. Comp. Zool., LXI, p. 100. ♀. [Texas.]

♀. Black; covered with minute tomentum which strongly reflects blue or greenish; front, dorsum, and front femora with only minute erect hair, propodeum bare. Wings infuscated, with a weak, dull, violet reflection.

Labrum emarginate; mandibles with two teeth on inner margin, neither notch nor tooth on the outer margin, but the apical portion expanded, lamelliform.

Dorsal measurements: a 28, b 30, c 15. Longer hind tibial spur three-sevenths as long as metatarsus. Length, 8 to 14 mm.

♂. Black, pubescence entirely cinereous, longer and denser on postscutellum and apex of propodeum. Wings hyaline.

Upper outline of head as seen from in front sinuate by reason of a strongly developed median hump, and a lesser one on each side. Antennae short, stout, the inferior margin somewhat crenulate, especially towards the apex; antennal measurements: 25: 4: 15: 18, greatest width 13.

Two spines on the under surface of front tibiae, the longer situated on the margin of the articulatory emargination, several short spines at apex and on the anterior side, one long one, evidently corresponding to the spur of the female, but less curved and more slender; anterior claw of front legs more strongly bent than the posterior claw, and on the left leg shorter, on the right leg less noticeably shorter, other tarsal claws slender with an erect tooth on lower margin; upper surface of hind tibiae with three rows of spines; metatarsi spinose; longer hind tibial spur three-quarters as long as metatarsus.

Sternite 7 bilobed, the emargination deep and narrow, exposing sternite 8 as a narrow tongue; the last sternite (Plate IV, figs. 6 and 9) slender, bilobed, ventrally with a median basal keel, its surfaces, especially edges and the keel, hairy. Phallus as shown on plate IV, figs. 10 and 11; parameres much longer than parapenial lobes, stalked, expanded and flattened apically, and terminating on the inner side in a large flat, transparent lamina devoid of setae, the stalk bearing a comb of stout curved setae on inner side, the apical portion divided longitudinally more or less in the middle into an outer brown portion, uniformly covered with setae, and the hyaline inner lamina above referred to as devoid of setae; a fringe of long setae on outer margin; parapenial lobes thick, straight, blunt, the longer transverse axis vertical; the aedeagus slender, shorter than the parapenial lobes which nearly conceal it from above, and concealed from below by the volsellae; the latter (Plate IV, fig. 11) large, transversely flattened as broad spatulate plates, longer than the parapenial lobes, the under surface uniformly beset with erect setae. Length, 8 to 9.5 mm.

Distribution.—TEXAS: Coryell Co., 1 ♀, [*holotype,* U. S. Nat. Mus.]. Lee Co.—Fedor, 1 ♂, May 27, (G. Birkmann), [Mus. Comp. Zool.]. MEXICO: Mexico.—Jilotepec, San Rafael, 3 ♀, [U. S. Nat. Mus., 2; Acad. Nat. Sci. Phila., 1]. Vera Cruz.—La Gloria, Cardel, 1 ♂, January 1938, (J. Camelo), [*allotype,* U. S. Nat. Mus.].

ALLAPORUS Banks

1933. *Allaporus* Banks, Psyche, XL, p. 2.

Type of genus: *Planiceps pulchella* Banks, by original designation.

♀. Antennal fossae oblique; lower margin of antennal sockets well above lower level of eyes; area frontalis perpendicular to plane of clypeus or of front; clypeus transverse but long, not strap-shaped, its surface a little convex, depressed at sides, its anterior margin rounded laterally and nearly truncate; mandibles with two small teeth on inner margin, none on inferior margin; hind margin of head not sharply defined; front convex both vertically and transversely; spatium frontale short and broadly V-shaped; an appreciable malar space; eyes bare, incurved above, reaching top of head. Antennae short and thick; scape short, barrel-shaped, not curved; pedicel nearly one-half as long.

Pronotum long, its anterior part slightly depressed to the level of the collar; metapostnotum nearly concealed; mesosternum ending in two short lamellae, separated by a shallow broad emargination. Front femora not incrassate, front tibiae not spinose beneath, a few short spines at apex; front tarsi not obviously spinose; all claws similar, small, slender, with a very small tooth on the lower margin. Posterior lobe of hind wings long and slender; stigma of forewing distant from apex; second submarginal cell trapezoidal or triangular, the two transverse cubital veins attingent anteriorly or not; second recurrent vein ending beyond the middle of the second submarginal cell; submedian vein apicad of basal vein, and in the hind wings the cubital vein arising very far beyond the submedian.

Color uniformly black, or the abdomen red.

♂. Very similar to the female; in one specimen the second recurrent vein of both right and left forewing lacking; front tarsal claws minute and difficult to resolve but appear nearly symmetrical, although the tooth on the anterior claw is a broader blunt lobe, on the posterior claw acute.

Abdomen compressed at tip, the tergites lapping around and nearly concealing the apical sternites; the seventh (6th) sternite notched, the ultimate slender, somewhat compressed, blunt at tip.

Parameres (Plate IV, fig. 12) extended outwards and somewhat pendant (in specimen examined), very short extending only to about one-half the length of the parapenial lobes or of the volsellae, stalked at base, spatulate, oblique at apex, bearing a few long setae on their inner margins; parapenial lobes blade-like, straight, as seen from the sides thick and bluntly rounded at apex, from dorsal view one sees the thin edge of the straight parallel blades, but forming the longest and dorso-ventrally widest element of the genital capsule; aedeagus concealed; volsellae barely shorter than parapenial lobes, appearing from the sides straight and thick, the apical part in dorsal view flattened and somewhat twisted; the cuspis represented by a minute hook, halfway of inner margin.

Distribution.—Nearctic Region, Austral Life Zone.

Allaporus rufiventris (Cresson) new combination (Pl. IV, fig. 12.)

1872. *Aporus rufiventris* Cresson, Trans. Amer. Ent. Soc., IV, p. 207. ♀. [Texas.]
1872. *Aporus minimus* Cresson, Trans. Amer. Ent. Soc., IV, p. 207. ♂. [Texas.] New synonymy.
1897. *Pompilus minimum* Dalle Torre, Catal. Hymen., VIII, p. 302.
1897. *Pompilus rufiventricosus* Dalle Torre, Catal. Hymen., VIII, p. 318.
1910. *Planiceps pulchella* Banks, Journ. N. Y. Ent. Soc., XVIII, p. 123. ♀. [Virginia and Texas.] New synonymy.
1919. *Aporus minimus* Bequaert, Psyche, XXVI, p. 122. ♂. [Virginia.]
1929. *Planiceps hesperus* Banks, Psyche, XXXVI, p. 327. ♀, ♂. [California.] New synonymy.
1933. *Allaporus pulchellus* Banks, Psyche, XL, p. 2.
1933. *Allaporus hesperus* Banks, Psyche, XL, p. 2.

♀. Black, the abdomen sometimes red, dusky at apex; hind femora red when abdomen is; sometimes also hind tibiae and middle femora; pubescence short, cinereous, brownish on dorsum, almost devoid of erect hairs except for a few on front. Wings uniformly but not deeply infuscated.

Distance of hind margin of head from hind ocelli equal to diameter of latter, and to about two-fifths their distance apart. Antennal measurements: 12:6:8:11.

Dorsal measurements: a 22, b 32, c 20. Longer hind tibial spur two-thirds as long as metatarsus. Length, 4.5 to 5.5 mm.

♂. Always entirely black with cinereous pubescence. Longer hind tarsal spur as long as metatarsus. The phallus is shown in plate IV, fig. 12. Length, 2.5 to 3.5 mm.

Distribution.—OREGON: Corvallis, 1 ♀, October 20, 1931, [U. S. Nat. Mus.]. CALIFORNIA: Lone Mt., San Francisco, ♂, ♀, [types of *hesperus,* Mus. Comp. Zool.]. TEXAS: Bosque Co., [type ♀ of *rufiventris,* type ♂ of *minimus,* Acad. Nat. Sci. Phila.]. Lee Co.—Fedor, ♀, [U. S. Nat. Mus.]. ALABAMA: 1 ♂, [U. S. Nat. Mus.]; Chambers Co.—Langdale, 1 ♀, (H. H. Smith), [U. S. Nat. Mus.]. VIRGINIA: Falls Church, ♂, (N. Banks), [Mus. Comp. Zool.]. MARYLAND: Glen Echo, 1 ♀, (R. M. Fouts), [U. S. Nat. Mus.]. Cabin John, 2 ♀, August 20, 1917 and September 1916 (R. M. Fouts), [U. S. Nat. Mus.; Cornell Univ.]. Plummer's Island, 1 ♂, August 6, 1915, (R. C. Shannon), [U. S. Nat. Mus.].

The males wherever found, as would be expected in this tribe, have the abdomen black; eastern (including Texan) specimens of the females have the abdomen and at least the hind femora red, and this is true of the only specimen that I have seen from the

North Pacific Coast. The California females described as *hesperus* are entirely black, but it seems probable that this is individual or regional variation.

RHABDAPORUS new genus

Type of genus: *Rhabdaporus bellus* new species.

♀. Conformation of head that of an *Aporus,* the front transversely flat, the surface of the eyes in the same plane, in profile curved toward vertex and nearly flat above antennae; the antennal fossae shallow, extending laterally but not vertically, so that there is no median nasus on the front, or at least it is very short and with widely flaring sides; antennal sockets well above bases of eyes; clypeus short, very transverse; clypeal suture straight; mandibles with one inner tooth and simple inferior margin; eyes bare, inner margins strongly concave, incurved on vertex and reaching posterior margin. Claws bifid, the inner ray broad and obliquely truncate. Second submarginal cell receiving both recurrent veins. Coloration as in *Euplaniceps,* tergites 2 and 3 spotted, the last tergite red and the wings banded.

Distribution.—Neotropical Region: Brazil.

Rhabdaporus bellus new species

1897. *Planiceps venustus* Fox, Proc. Acad. Nat. Sci. Phila., 1897, p. 262. ♀. [Brazil: Pará.] Misidentification.

♀. Black; lateral spots on tergites 2 and 3 white; tergite 6 orange (mikado orange); antennae beneath except towards apex ferruginous; calcaria white; antennal sockets, clypeus, legs, more or less of sides and of underparts, propodeum apically and laterally, sides of scutellum, and the postscutellum with thin griseous pubescence, elsewhere the pubescence black, or on legs brownish golden; very short erect black hairs on head, pronotum and legs. Fore wings black, a broad milky-white band, with pale veins and white setae, extending from apical half of first submarginal cell to basal half of first apical cell, a white spot before apex of median cell; hind wings hyaline with dusky apex.

Viewed from above, the anterior outline of head almost a straight, slightly and evenly arcuate line, the surface of the eyes being continuous with that of the front; head measurements: a 31, b 36, c 16, d 15, e 21, f 24, g 6, h 5, i 15; area frontalis perpendicular to plane of the clypeus, which is barely convex, not depressed laterally at base, the clypeal suture straight; frontal fissure faintly and discontinuously impressed half-way to front ocellus; latter in a small depression; vertex depressed laterad of hind ocelli, not noticeably elevated between them; vertex margined posteriorly by a weak ridge, the posterior margin concave; ocellar measurements: a 4, b 6, c 16, d 14. Antennal measurements: 10:3:9:7.5.

Dorsal measurements: a 26, b 29, c 16: dorsal surface of pronotum not margined laterally in front, weakly margined posteriorly; streptaulus weak medially, extending but little behind shoulders; a groove above spiracular tubercles; metapostnotum concealed medially, vertical and not striate laterally, but with one or two carinae; mesosternum laminate at apex. Front femora a little less than one-third as wide as long; posterior margin of under surface of front tibiae with two spines, one situated in the articulatory emargination, the apex with only minute spinules, side of metatarsi with three spines and a fourth at apex, also the usual median row underneath; all claws similar, the outer ray curved, short, the inner scarcely shorter, broad, obliquely truncate, parallel and close to outer, the fan of about twelve curved bristles, nearly as long as the claws; hind tibial spur one-half as long as the metatarsus.

It does not seem safe to accept Fox's conclusion that this insect is *venustus* Guerin. It differs from Guerin's description [43] in certain respects, and comes from a very different part of South America, which is of significance, for the distribution of the members of this tribe seems to be closely limited.

Holotype.—Female, Santarem, Pará, Brazil, (H. H. Smith), [Carnegie Mus.].

ASPIDAPORUS new genus

Type of genus: *Planiceps jugosus* Fox.

♀. With the general conformation and character of *Euplaniceps,* from which it differs in the following respects: ocelli smaller, vertex rounding more fully into occipital surface; disc of pronotum acutely margined laterally; front femora not incrassate; second recurrent vein opposite the second transverse cubital vein.

♂. Black, with white calcaria, white pubescence and hyaline wings. Second transverse cubital vein opposite second recurrent vein.

The phallus (Plate IV, fig. 14) is similar in type to that of *Euplaniceps.*

Distribution.—Neotropical Region: Brazil.

Aspidaporus jugosus (Fox) new combination

1897. *?Planiceps jugosus* Fox, Proc. Acad. Nat. Sci. Phila., 1897, p. 262. ♀. [Brazil: Matto Grosso.]

♀. Black, a buff spot on each side of tergites 2 and 3, tergite 6 entirely orange (mikado orange) except margins, mandibles and antennae beneath ferruginous; pubescence of head, sides, under parts, legs, propodeum, and more or less on bases of first three tergites silvery, dense in spots; a little more than apical half of mesonotum densely covered with long yellowish tomentum; disc of pronotum with dense, short, black pubescence and velvety

[43] Iconogr. Regn. Anim., VII, Ins., p. 435, 1844.

lustre. Fore wings infuscated, the apex, a band behind stigma, and the median cell except base and apex hyaline.

Head smooth, the minute punctulation sparser than usual; sides of thorax and entire propodeum densely, evenly and coarsely granulate. Not slender, and abdomen not compressed.

Head measurements: a 19, b 22, c 12, d 9, e 14, f 13, g 7; outline of head in profile curved below antennae, nearly straight above; the nasus a low broad ridge; area frontalis broad, descending obliquely and but slightly to the clypeus, which in profile continues the general curve of the outline of the head, a little deflected from the plane of the spatium frontale; eyes a little inflated; antennal fossae shallow, extending to orbits; clypeus flat, produced into a broad median lobe with oblique sides rounding into an almost transverse apical margin; mandibles with an inner tooth, the inferior edge with only a minute denticulation; frontal fissure delicate, weak; front ocellus in a depression; vertex barely flattened laterad of ocelli, raised between them; posterior margin of head not sharp, forming no ridge, rounding gradually into occipital surface, the margin truncate but projecting medially; ocellar measurements: a 2, b 2, c 14, d 12. Antennal measurements: 16:5:13:13.

Dorsal measurements: a 16, b 16, c 11; disc of pronotum flat and margined laterally by an acute projecting carina, in a manner not seen in any other known member of the subfamily; streptaulus weak, becoming obsolete on anterior part of side-pieces of pronotum, a depression in front of spiracular tubercles. Front femora not incrassate, one-quarter as wide as long; front tibiae and tarsi destroyed in the unique type; all claws except one hind claw destroyed in type, that claw slender, but slightly curved, the tooth very short, but little more than a shoulder, nearly as in Haupt's fig. 84E.[44]

Distribution.—BRAZIL: Matto Grosso.—Chapada, 1 ♀, April, (H. H. Smith), [*holotype,* Carnegie Mus.].

Aspidaporus minusculus new species (Pl. IV, fig. 14.)

♂. Shining black with white calcaria; pubescence scant, white, except on last tergites. Wings hyaline, faintly clouded in the region of the marginal cell.

Head from in front with strongly convex upper outline, continuing the outer orbits with little break, slightly bluntly pointed in middle; hind margin of head rounding, without a ridge on posterior surface which is flat in center, convex at sides, to the well-marked occipital carina, below which it is concave; vertex prominent between ocelli; ocellar measurements: a 4, b 3, c 12, d 9.

Front claws asymmetrical, the anterior one with more strongly curved apical ray, which is more distant from inner, the latter a rounded lobe; other claws with a small tooth; longer hind tibial spur ninety-three hundredths as long as metatarsus. Second recurrent vein opposite second transverse cubital.

[44] Description drawn from type, so labelled in Fox's handwriting.

Last sternite with sides flaring dorsad, so as to make it trough-shaped, slender, tapered and subacute, weakly keeled, in profile tapered to apex. Phallus as shown on plate IV, fig. 14; parameres about as short as in *Psorthaspis,* rod-like, parallel-sided, truncate, with few and small setae; volsellae, as seen from below, flattened and twisted, with a broad, slightly obtusely-pointed, apex; aedeagus a slender rod; apical laminae of parapenial lobes in profile longer than wide. Length, 4 mm.

Holotype.—Male, Campinas, São Paulo, Brazil, February 3–25, 1937, (E. J. Hambleton), [U. S. Nat. Mus.].

Paratypes.—2 ♂, with same data as for type, [Acad. Nat. Sci. Phila.; U. S. Nat. Mus.].

EUPLANICEPS Haupt

1930. *Euplaniceps* Haupt, Mitt. Zool. Mus. Berlin, XVI, pp. 724 and 751.

Type of genus: *Pedinaspis variipennis* Perty, by original designation.

♀. Area frontalis usually perpendicular to the level of clypeus and of front, but sometimes merely slightly inclined, and in some instances connecting the two on the same plane, as in most species of *Psorthaspis,* and forming with the spatium frontale a broad flat bridge between the two; antennal sockets close to the clypeal margin, their inferior borders well above the lower limit of the eyes; antennal fossae continued vertically upward, paralleling the inner orbits, about half-way to the front ocellus, their inner borders parallel, and separating them from a raised median strip, or ridge, the summit of which in profile is straight, not or but little convex; clypeus nearly flat, one-third as long as wide, its anterior margin straight medially, rounded at sides; mandibles slender, inner margin with an acute tooth at apical third, the inferior with or without an erect tooth at same position; malar space wanting; eyes bare, long, narrow, reaching summit of head, in general parallel but the inner margins concave; ocelli placed near hind margin of vertex which is not sharp, concave, but posterior surface tends to be more convex than otherwise. Antennae of moderate length, not thickened, the scape nearly cylindrical, neither bent nor flattened, the segments slender.

Thorax and abdomen usually long and slender, the latter compressed; pronotum long, very slightly depressed to the level of the collar; streptaulus continuous from side to side; metapostnotum short, in a deep depression, laterally nearly vertical and striate; mesosternum ending in two lamellae or not. Front femora incrassate; no tarsal comb; tarsal claws strongly curved, alike, slender, with an erect tooth within; the empodial fan prominent, with about ten bristles; second submarginal cell long and low, the transverse cubital veins being widely separated along the radius, receiving a recurrent vein at a considerable distance from base and apex; 3d discoidal cell longer

than high; basal vein and submedian almost opposite; cubital vein of hind wing arising beyond submedian.

Black, tergites 2 and 3 spotted or banded; last tergite with a median pale stripe. Tomentum very fine and sericeous, tending to be cinereous, brown or golden, without blue or violet reflection. Wings infuscated and banded.

♂. In general similar to female; clypeus longer and its basal margin not transverse; antennal fossae weakly indicated; pronotum not so long, curved more deeply to the collar; metapostnotum (in species observed) long and flat.

Anterior claw of right front leg more strongly curved and its basal lobe broader than the posterior claw, but not differing much in length, claws of left front legs symmetrical; claws of other legs slender, less curved, with a smaller oblique tooth on inner margin; empodial fans small, composed of few bristles.

The phallus (Plate IV, fig. 15) of the only species of which the male is known is similar in type to that of *Aspidaporus,* and is not likely to differ widely from that of the other species of *Euplaniceps.* The parameres are slender, rod-like, shorter than the parapenial lobes.

Entirely black except for white calcaria, and the hind tibiae spotted; pubescence black or white. Wings dark and banded.

In this genus there exist pronounced structural variations of the female in the following respects: the inferior margin of the mandibles may be entire or have a minute to small tooth, never long and acute; the area frontalis may be perpendicular, oblique, or nearly in the plane of the front and clypeus; the mesosternum may have or lack the usual apical laminae; the claws, usually slender and with an erect acute tooth on the lower margin, may have this tooth very small, or in other cases shifted in position, being close to and paralleling the apical ray so that the claw is bifid, and the inner ray either short, slender, and weakly obliquely truncate, or broader and obviously obliquely truncate as in *Drepanaporus.*

Except for *Aporus calcaratus* Fox this and *Aspidaporus* are the only genera in which I have observed males with white calcaria, and this character may be distinctive, or it may vary with the species.

Distribution.—Neotropical Region: Continental South America.

There are four species that presumably belong in *Euplaniceps* but remain unknown to me; some of them may represent species described or redescribed in this paper, but I am unable to so identify them with certainty. Since the coloration of species of this genus seems to be subject to little variation, so far as one can

judge from the few individuals known, the following color key may be helpful in locating them:

Tergites 2 and 3 banded.....**lacordairii** (Guerin)
Tergites 2 and 3 spotted.
  Tergite 4 spotted.
    Scutellum, stripe on pleura and one on side of propodeum densely silvery-tomentose; propodeum otherwise black; fore wings black with hyaline cross-bar and a hyaline bar in median cell. **perpicta** (Fox)
    Only propodeum silvery; fore wings hyaline with 2 broad black bands.....**variipennis** (Perty)
  Tergite 4 not spotted.
    Spots on tergites 2 and 3 rose red.
      Stripe on tergite 6 white; coarsely punctate. **punctata** new species
      Stripe on tergite 6 light red; presumably not coarsely punctate. **ornatula** (Dalle Torre)
    Spots on tergites 2 and 3 yellow or white.
      Spot on tergite 6 white, or yellowish white, on 2 and 3 white; some brilliantly silvery spots or bands present.
        Posterior margin of scutellum, postscutellum and propodeum silvery tomentose.....**quadrimaculata** (Smith)
        A band on pleura, crossing dorsum between bases of fore-wings, silvery.....**saussurei** (Kohl)
      Spot on tergite 6 orange or red, those on 2 and 3 yellow or white; some silvery or golden spots present.
        Wing-bands yellow. Southern Argentina. **venusta** (Guerin)
        Wing-bands white. Paraguay, Brazil and Peru. **sima, varia** and **petulans** new species
      All spots yellow; no strongly yellow or silvery spots or bands present (except a weak yellow band on posterior margin of mesoscutum).....**herberti** (Fox)

Key to the Subgenera of Euplaniceps

Females [45]

Claws with an acute tooth on lower margin, remote from apical ray *Euplaniceps* Haupt
Claws cleft, the inner ray near to and parallel with the outer, obliquely truncate.....*Pholidaporus* new subgenus

[45] The males are known of *Euplaniceps* only.

Subgenus **EUPLANICEPS** Haupt

1930. *Euplaniceps* Haupt, Mitt. Zool. Mus. Berlin, XVI, pp. 724 and 751.

Key to the Recognized Species of the subgenus Euplaniceps

Females

1 a. Area frontalis nearly flat, connecting the front and clypeus on almost the same plane or slight even curve.....6

b. Area frontalis strongly inclined or perpendicular to the plane of the clypeus, which is sunken below that of the median part of front (nasus) 2

2 a. Mesosternum rounding posteriorly between the coxae, devoid of laminae 4

b. Mesosternum terminating in the usual two laminae.....3

3 a. Tergites 2, 3 and 4 each with a pair of white spots, 6 orange; scutellum entirely densely silvery pubescent.....**varia** new species

b. Tergites 2 and 3 with yellow spots, 4 immaculate, 6 yellow; scutellum with silvery or faintly yellow pubescence only at apex **herbertii** (Fox)

4 a. Lateral pieces of pronotum and front femora not heavily punctate.....5

b. Side pieces of pronotum and front femora with deep, coarse, numerous but well separated punctures.....**punctata** new species

5 a. Sides of dorsal surface of pronotum margined; wing membrane milky hyaline, the veins all brown, a fuscous band crossing wing behind costal cell, beginning at basal vein and extending nearly to apex of second discoidal cell, vaguer in anal cell, apex of wing beyond middle of stigma fuscous; a transverse basal yellow band on tergite 2 **lacordairii** (Guerin)

b. Sides of dorsal surface of pronotum not margined; wing membrane yellow, the setae and veins of yellow parts golden (except costa and subcosta), the first fuscous spot smaller, not involving the apical half of the second discoidal cell nor the anal cell; apex of wing beyond middle of stigma with a fuscous band fading into a yellowish hyaline apex; second tergite with two yellow spots.....species *

6 a. Longer hind tibial spur one-half the length of the metatarsus; pronotum as wide as long; no ridge between antennal fossae and orbits; mesonotum with orange or yellow pile; last tergite orange-yellow.....7

b. Longer hind tibial spur one-third the length of the metatarsus; pronotum one-fifth longer than wide; a ridge between antennal fossae and orbits; mesonotum with black, at apex silvery, pile; last tergite black with a basal white stripe.....**saussurei** (Kohl)

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* This species from British Guiana will shortly be described by Mr. Banks. For obvious reasons I refrain from mentioning the name he will use.

7 a. Last tergite orange red, metapostnotum fully exposed, vertical, striate **sima** new species

b. Last tergite black; metapostnotum concealed medially, not striate **petulans** new species

Males

The males are known of *saussurei* only

Euplaniceps (Euplaniceps) herbertii (Fox) new combination

1897. *Planiceps herbertii* Fox, Proc. Acad. Nat. Sci. Phila., 1897, p. 261. ♀. [Brazil: Pará.]

♀. Black, a large yellow (light orange-yellow) spot on each side of tergites 2 and 3, and a large median spot at base of tergite 6 of same color; mandibles except tips and edge of clypeus ferruginous; calcaria white. Head, lateral and ventral parts, apex of propodeum and the legs bearing short, sericeous, silvery pile, replaced on the dorsum and to some extent on the upper part of the head with brown pubescence; posterior margin of mesonotum and sides of postscutellum with short pale golden tomentum, not very dense nor conspicuous; front, dorsum (but not of propodeum), front coxae, femora and tibiae with sparse, erect, pale, hairs, scarcely any on mesopleura. Following parts of fore wing deeply infuscated, but without violaceous reflection: apex to apical third of stigma, except for the narrow paler (but not hyaline) apical margin; a broad band (not involving costal cell) beginning just basad of basal vein and extending less than half-way across first submarginal cell, half-way across first discoidal cell, to apex of the second and to the anal margin; the basal half of the median and submedian cells shaded by long black setae; other parts of wing yellow-hyaline, as follows: a broad band, on which both setae and veins are yellow, crossing wing at apex of first and base of second submarginal cells, the costal cell, and the median and submedian cells basad of the fuscous band; hind wings nearly hyaline, barely tinted yellow, the apex slightly infuscated.

Head from in front broad; the eyes wide, inflated; head measurements: a 35, b 46, c 19, d 15, e 22, f 25, g 15, h 5, i 18; head in profile showing a straight line from front ocellus to spatium frontale, but from above seen to form medially a raised nasus that rounds into the narrow area frontalis and drops almost perpendicularly to the level of the clypeus; latter with lightly convex surface, a depression on each side at base, anterior margin rounding broadly; mandibles with a single tooth on inner margin near the apex, inferior margin with a short broad tooth at same position; frontal fissure a fine impressed line on bridge of nasus, extending slightly farther upward than do the antennal fossae; front ocellus in a pronounced basin and a depression extending from each hind ocellus to eyes; the vertex between hind ocelli prominent and divided by a median longitudinal furrow; hind margin of head concave, forming a weak ridge immediately behind ocelli from where

it drops abruptly, (this ridge is more pronounced in the Kartabo specimen than in the type); ocellar measurements: a 4, b 7, c 18, d 13. Antennal measurements: 11:3:8:5.

Dorsal measurements: a 35, b 36, c 22; lateral margins of dorsal surface of pronotum distinct but rounded; streptaulus interrupted medially, deep at humeri, interrupted at anterior third of lateral face of pronotum, represented by a long, sharply impressed, longitudinal line in front of spiracular tubercle; metapostnotum with coarse lateral striae; apical laminae of mesosternum small, depressed, separated by a narrow notch. Front femora strongly incrassate, length to width as 36:19; no spines beneath nor along lateral or apical margins of front tibiae (except two minute subapical spines that do not project across apical margin) and none on sides of tarsal segments; middle tarsal claws (and presumably the hind ones, but these broken off in type) with apical ray and tooth long, slender, acute, and nearly perpendicular to long axis of claw, slightly divergent but otherwise very nearly as shown in Haupt's fig. 84C; [46] front claws similar, but the inner tooth much shorter. Length, 15.5 mm.

The specimen from Kartabo differs in having the clear areas of the forewings barely tinted yellow, and the yellow spots on the tergites paler (pale orange-yellow).

Above description drawn from specimen in the Carnegie Museum, Pittsburgh, labeled type in Fox's handwriting.

Distribution.—BRAZIL: Pará.—Santarem. BRITISH GUIANA: Bartica District.—Kartabo, 1 ♀, May 26, 1924, [Mus. Comp. Zool.].

Euplaniceps (Euplaniceps) varia new species

♀. Coal-black, tergites 2–4 with lateral white spots, tergite 6 orange (salmon-orange) except for dusky margins, mandibles apically ferruginous; pronotum including lateral faces, mesonotum, and a broad band across base of dorsal and lateral faces of pronotum mat, velvety black, the tergites not mat nor velvety; remainder of head and body and most of legs covered with a silvery pubescence, giving in places and certain lights a brilliant reflection, becoming more conspicuous tomentum on hind margin of mesonotum and scutellum; head, front femora, coxae and tibiae with sparse, erect, pale hair, dorsum of pronotum with erect black hair. Wings black, without reflection, with sharply delimited areas of milky white as follows: narrow apical border, a band extending from apex of costal cell, apical half of first submarginal and base of second to basal half of first apical cell, and a spot across the median cell before its apex, extending with less intensity on to the costal and submedian cells; veins on the central pale area pale and the setae whitish, but very short; hind wings nearly hyaline with weakly brownish areas.

[46] Mitt. Zool. Mus. Berlin, XVI, 1930.

Head measurements: a 34, b 40, c 18, d 15, e 22, f 23, g 14, h 6, i 17; outline of profile curved below front ocellus, then straight to area frontalis, the nasus low and broad, narrow between antennae and rounding into an almost perpendicular area frontalis; antennal fossae extending to eyes which are not inflated; clypeus with lightly convex surface, a slight depression below each antennal fossa, the anterior margin broadly rounded, almost straight medially; mandibles slender, with a single preapical tooth on inner margin, and a mere denticle in similar position on inferior margin; frontal fissure a fine impressed line extending upwards as far as do the antennal fossae; front ocellus in a weak depression, the surface laterad of each hind ocellus flattened, the areas between the latter scarcely raised; hind margin of head concave, not limited by a sharp ridge; ocellar measurements: a 6, b 6, c 15, d 16. Antennal measurements: 12:3:8:6. Head and thorax with only the usual minute close-set punctulation.

Dorsal measurements: a 27, b 29, c 19; streptaulus weak medially, deeply impressed at humeri, absent from posterior three-quarters of side-pieces of pronotum, merely a slight depression in front of spiracular tubercles; postscutellum with median tubercle; metapostnotum striate, more exposed medially than in preceding; laminae at apex of mesosternum small, depressed, separated by a narrow slit-like notch. Length to width of front femur as 35:15; two small spines under front tibiae along hind margin, five minute spines along hind margin at apex, too short to reach the apical margin; no spines on sides of tarsal segments; claws as in preceding species. Length, 14 mm.

Holotype.—Female, San Roque, near Iquitos, Loreto, Peru, April 1929, (Klug), [Cornell Univ.].

Euplaniceps (Euplaniceps) lacordairii (Guérin-Méneville) new combination

1845. *Planiceps lacordairii* Guérin-Méneville, Species et Inconogr. Génér. Animaux Artic., VII, p. 434. [Brazil.]
1897. *Pompilus lacordairei* Dalle Torre, Catal. Hymen., VIII, p. 297.
1911. *Planiceps zikani* Schrottky, Ent. Rundschau, XXVIII, p. 20. ♀. [Brazil: Minas Geraes.] New synonymy.

♀. Black, tibiae and tarsi brownish red, tergites 2 and 3 with a basal yellow (maize-yellow) band, that on third narrower, tergite 6 with an elongate dorsal strip of same color; mandibles ferruginous toward apex; calcaria white. Pubescence of clypeus, legs (dark parts), sides (except pronotum), sides of scutellum, apex of propodeum and under parts silvery, sparse, that of front, entire pronotum, mesonotum except apex, most of scutellum, postscutellum, and most of propodeum velvety black, that of apical margin of mesonotum, tip of scutellum and a little at base, and on red parts of legs golden; front, dorsum except propodeum, front femora, coxae, and tibiae with fine, erect, pale hair. Wings whitish hyaline, the front pair black

from stigma to apex, a fuscous area involving extreme apex of median cell, base of first submarginal, basal half of first discoidal cell, three-quarters of second, and apical half of anal cell; entire anal cell a little clouded, as also base of median; apical margin of hind wings infuscated; veins black, those of the median pale area yellowish brown.

Head measurements: a 31, b 36, c 17, d 17, e 21, f 22, g 14, h 6, i 17; in profile outline below front ocellus curved, straight only near antennae; nasus moderately elevated, rounding into the area frontalis which is narrow, oblique but descending strongly to the level of the clypeus; antennal fossae extending to orbits, deeply excavated; clypeus lightly convex, weakly depressed in front of each antennal fossa, its anterior margin broadly curved at sides, nearly straight across center; mandibles with a single inner tooth and a pronounced, incurved, acute, but broad and low tooth on the inferior margin; frontal fissure a fine impressed line extending about as far as do the antennal fossae; front ocellus in a depression; surface at sides of hind ocelli flattened; area between them raised; hind margin of head a little concave, forming somewhat of a ridge, but not sharp; ocellar measurements: a 5, b 7, c 15, d 17. Antennal measurements: 11:2:7:8. Head with the usual close, minute, punctulation, and with scattered shallow larger but still small punctures.

Dorsal measurements: a 30, b 29, c 15; side margins of dorsal surface of pronotum distinct, but rounded; streptaulus impressed continuously to middle of lateral pieces, and represented by a long oblique groove in front of spiracular tubercles; postscutellum knob-like; metapostnotum rather weakly striate; apex of mesosternum rounded, not laminate, the laminae perhaps represented by two small tubercles close to coxae. Width of front femora to length as 15:32; front tibiae devoid of spines underneath, with 2 minute spines, directed sideways, at apex, no spines on sides of front tarsi; claws as in preceding two species. Length, 15 mm.

Distribution.—BRAZIL: Santa Catharina.—Nova Teutonia, Lat. 27° 11′ S., Long. 52° 23′ W., 2 ♀, January 31, 1939 and November 30, 1939, (Fritz Plaumann), [Mus. Comp. Zool.]. Minas Geraes.—Mar de Hispana, 1 ♀, February 1, 1909, [type of *zikani*].[47]

Euplaniceps (Euplaniceps) punctata new species

♀. Black, tergites 2 and 3 each with two large orange-red (flame-scarlet) spots, tergite 6 with a long dorsal white stripe; mandibles, clypeus except base, antennae especially beneath and apically, ferruginous. Head, pronotum including side-pieces, rest of dorsum except scutellum and spot at apex of mesonotum and including a broad stripe extending to apex of propodeum,

[47] As I have not seen the type, the identification is presumptive. Guérin-Méneville does not mention the reddish legs. The description of *zikani* does not indicate any difference from *lacordairii* but I have not seen the type of it either.

and most of front legs with black pubescence, elsewhere pubescence mostly silvery, strongest on scutellum and sides of propodeum, a little on dorsum of abdomen; scanty erect hair on head and on fore legs where it is shorter and stouter, replaced on dorsum of pronotum by abundant, erect, very short, black bristles. Wings infuscated, the following parts milky hyaline: a broad cross-band commencing below stigma, occupying apical half of first submarginal cell, basal third of second, apical third of first discoidal and basal half of second, none of third, and basal half of first apical cell, a bar occupying all but base and apex of median cell; hind wings hyaline, weakly infuscated at tip.

Long, slender and compressed, the following parts with deep round and widely separated punctures and smooth shiny intervals: side-pieces of pronotum, front femora and tibiae, similar punctation on front and clypeus but not so coarse, similar punctation on pleura, coxae, and middle and hind legs, but to varying degrees obscured or the shininess of the intervals dulled by minute pubescence, also similar on dorsum of pronotum, but this surface mat from the bristles and pubescence; abdomen shiny and without coarse punctures.

Eyes moderately prominent; the head measurements: a 32, b 39, c 21, d 17, e 23, f 22, g 11, h 6, i 18; profile of face with outline evenly convex from front ocellus to area frontalis, the nasus moderately elevated, its bridge forming a sharp ridge, marked by the frontal fissure to the height of the extent of the antennal fossae; area frontalis narrow and oblique but strongly inclined; clypeus at a much lower level, its surface a little convex, depressed at sides both in front and more strongly behind, its anterior margin broadly rounded; antennal fossae extending to eyes, not deeply impressed; mandibles with a single tooth on inner margin, and just basad of it on outer margin, a notch and bluntly rounded, short tooth; front ocellus in a slight depression, the vertex laterad of the hind ocelli flattened, raised and with a weak median depression between the ocelli; hind margin of head not sharp, nearly truncate, but slightly prominent medially; ocellar measurements: a 5, b 6, c 22, d 18. Antennal measurements: 9.5:2:7:6.

Dorsal measurements: a 30, b 32, c 13; dorsal surface of pronotum not margined laterally; streptaulus weakly impressed in center, ending at apical third of side-pieces of pronotum; a pit in front of spiracular tubercle; metapostnotum striate; mesosternum not laminate, rounded at apex between legs. Length to width of front femora as 30:12; one or two stout setae, rather than spines, underneath front tibiae, two minute spines directed transversely at apex on inner side; no lateral spines on tarsi; claws a little more slender and less bent than in preceding species, much as shown in Haupt's fig. 84D; * longer hind tibial spur one-half length of metatarsus. Length, 15 mm.

Holotype.—Female, Santa Cruz, Bolivia, (J. Steinbach), [Mus. Comp. Zool.].

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* Mitt. Zool. Mus. Berlin, XVI, 1930.

Euplaniceps (Euplaniceps) petulans new species

♀. Black, a small cream-colored spot on each side of tergites 2 and 3, tergite 6 entirely orange (deep chrome to light orange); mandibles ferruginous at apex; antennae brownish, more or less ferruginous beneath; calcaria white. Mesonotum except anterior margin densely covered with appressed orange tomentum; propodeum, pleura and more or less of legs silvery; head with thin, inconspicuous, silvery pubescence, yellowish on vertex; pronotum, including sides, velvety with black pubescence; a little fine, erect, pale hair on head, pronotum, and front legs. Wings as described for *punctata.*

Head measurements: a 25, b 28, c 15, d 12, e 18, f 18, g 10, h 4, i 12; outline of head in profile evenly convex from front ocellus to area frontalis; center of front hardly forming a nasus, merely a low rounded ridge, the area frontalis broad, descending very slightly and very obliquely to the clypeus which is almost in the plane of the front; antennal fossae extending to the orbits, moderately excavate; clypeus lightly convex, its anterior margin broadly rounded, its surface curving downward to apex and depressed in front of each antennal fossa; mandibles with a single inner tooth, the inferior margin simple; outline of profile evenely rounded from vertex to spatium frontale; nasus a low broad ridge; antennal fossae well-marked, extending to orbits; clypeus nearly flat but its apical half slightly deflected and flattened, the surface depressed on each side below antennal fossae, the anterior margin broadly, evenely, rounded; frontal fissure delicate, extending upwards as far as do the antennal fossae; front ocellus in a slight depression, the vertex not noticeably flattened, scarcely raised between the ocelli; hind margin of head slightly concave; ocellar measurements: a 3, b 4, c 16, d 13. Antennal measurements: 7:2:5:4.

Dorsal measurements: a 22, b 22, c 15; pronotum barely margined laterally; streptaulus obsolete in middle, impressed on apical third of lateral face of pronotum, a depression in front of spiracular tubercles; metapostnotum not striate, concealed medially; mesosternum slightly laminate, rounding medially to posterior surface, yet with lateral ridges extending to coxae which form small laminae as seen from beneath. Width of anterior femur to length as 10:23; front tibiae with three spines on hind inferior margin, the last in the articulatory emargination, some minute spines at apex, only the median row under metatarsus; claws as in *sima;* longer hind tibial spur one-half as long as metatarsus. Length, 10 mm.

Holotype.—Female, Villa Rica, Paraguay, April 1938, (F. Shade), [Cornell Univ.].

Euplaniceps (Euplaniceps) sima new species

♀. Color as in *petulans,* except that lateral spots on tergites are larger and white, and entire last segment is orange (mikado orange); vestiture as as in *petulans,* except that tomentum of mesonotum is not so dense nor so pale a yellow; and silver of propodeum is confined to the apical half, where it is less conspicuous medially. Wings as in *petulans.*

Head measurements: a 30, b 33, c 18, d 15, e 21, f 20, g 13, h 6, i 15; outline of head in profile curved but somewhat broken between front ocellus and spatium frontale, being nearly flat above the latter; the nasus a low, broad, rounding ridge, the area frontalis slightly deflected from its plane, nearly parallel, and the plane of the clypeus continuous with that of the spatium frontale, but both slightly diverging from that of front; antennal fossae well excavated, extending to orbits; clypeus flat transversely, slightly depressed in front of each antennal fossa, its apex decurved, the margin broadly and evenly rounded; the mandibles broad, with an inner tooth, the inferior margin simple; frontal fissure a finely impressed line extending from above spatium frontale not as far upward as do the antennal fossae; front ocellus in a very slight depression, the vertex barely flattened laterad of the hind ocelli and not raised between them; hind margin of head slightly concave; ocellar measurements: a 4, b 5, c 19, d. 15. Antennal measurements: 8:2:6:5.

Dorsal measurements: a 26, b 28, c 17; side margins of pronotum weakly marked, rounded; streptaulus nearly obsolete medially, deep at shoulders, extending less than half the length of sides of pronotum; a depression in front of spiracular tubercles; metapostnotum striate; mesosternum not laminate, its apex rounding upward in the center, yet with a ridge toward each coxa which suggests the rudiment of a lamina. Width to length of front femora as 12:30; posterior margin of under surface of front tibiae with two spines, the second located on the margin of the articulatory emargination, the apex with several minute spines; front metatarsus with a lateral spine before the apex and a short stout one at it, the median row of spines underneath strong and black; hind tarsal claw slender, the outer ray little curved, the tooth short, very much as shown in Haupt's fig. 84 D,[48] the front and middle claws with the outer ray more curved; longer hind tibial spur one-half the length of metatarsus. Length, 12.5 mm.

Holotype.—Female, Valera, Venezuela, 1800 ft. alt., (E. P. de Bellard), [U. S. Nat. Mus.].

Euplaniceps (Euplaniceps) saussurei (Kohl) new combination
(Pl. IV, fig. 15.)

1851. *Planiceps variipennis* Spinola, In Gay, C. Hist. Fisica y Politica de Chile, VI, p. 371, pl. 4, fig. 4. ♀, ♂. Misidentification.
1867. *Aporus variipennis* Saussure, Reise Novara., Zool. II, Hymen., p. 45. ♂, ♀. [Chile.] Misidentification.
1885. *Planiceps saussurei* Kohl, Ent. Nachr., XI, p. 164.
1897. *Pompilus saussurei* Dalle Torre, Catal. Hymen., VIII, p. 320.

♀. Black, a white spot on each side of tergites 2 and 3 and at base of 6; antennae ferruginous underneath; calcaria white; silvery pubescence on head, legs, lower plate of mesopleura, and under parts, thin and showing in

[48] Mitt. Zool. Mus. Berlin, XVI, 1930.

favorable light; a stripe of long dense silvery tomentum beginning on middle coxae and extending obliquely upwards across pleura, base of wings, posterior margin of mesonotum and base of scutellum; a similar silvery stripe on hind coxae; pronotum, scutellum except base, postscutellum, entire propodeum, upper plate of mesopleura, coxae underneath, most of sternum with short black pubescence showing in places a dull purplish reflection; sparse, erect hair on head, pronotum, and legs. Fore wings deep black, with a narrow, sharply delimited, white band entirely across wing from base of stigma, and a similarly white bar in middle of median cell, these accentuated by white setae.

Head measurements: a 37, b 39, c 23, d 20, e 27, f 23, g 15, h 8, i 13; outline of head in profile curving below front ocellus, nearly straight above antennae; nasus very low, broad, with no median ridge; area frontalis broad, flat and bridging front to clypeus in almost the same plane; antennal fossae well marked, a slight ridge between them and orbits below; eyes not raised above level of front; clypeus very flat, produced far over mandibles, a little depressed in front of each antennal fossa, its anterior margin produced, oblique at sides, nearly straight anteriorly; mandibles with an inner tooth, the inferior margin simple; frontal fissure a fine line, in a furrow, faintly extended to ocellus; front ocellus not in a basin; a transverse furrow laterad of hind ocelli; vertex not prominent between ocelli, longer than usual, its posterior margin concave, without a ridge; ocellar measurements: a 11, b 7, c 21, d 22. Antennal measurements: 10:2:7:6.

Dorsal measurements: a 40, b 33, c 13; dorsal surface of pronotum faintly margined laterally; streptaulus nearly obsolete except at humeri; a slight depression in front of spiracular tubercles. Front femora one-half as wide as long; five spines along hind margin of under surface of front tibiae, the last one on margin of articulary emargination; some minute spinules at apex; three small spines along lateral margin of metatarsus, a longer, flattened and fluted spine at apex; claws similar, the outer ray slender, curved, the inner tooth short, acute. Length, 8 to 13.5 mm.

♂. Black, a white stripe on upper surface of hind tibiae, close to base; calcaria white except at apex; appressed tomentum dark; long erect black hair on head, dorsum, mesopleura, and front coxae, also beneath front femora, none on propodeum. Wings infuscated, with 2 narrow white bands. Longer hind tibial spur four-fifths as long as metatarsus.

Abdomen strongly compressed, the tergites partly concealing the sternites, their sides meeting or nearly meeting in the midventral line at the base of even the second and third segments. Sternite 7 (6) with a deep apical V-shaped notch, the last sternite small and tongue-like.

Genital capsule (Plate IV, fig. 15) broad and short; parameres short, slender, slightly flattened rods, not enlarged but in profile obliquely truncate at apex, extending to about three-quarters the length of the parapenial lobes, chitinized, their inferior margins sparsely fringed with fine pale, erect setae. Parapenial lobes about as long as the volsellae, straight, compressed, like

thickened blades with straight parallel inner margins, as seen from the sides broad and bluntly tapered; aedeagus small, slender, concealed beneath parapenial lobes; volsellae large, strap-like, their apical part flattened and curved both upwards and a little inwards, the inferior surface with fine, erect setae; cuspis volsellaris an acute recurved hook. Length, 7 mm.[49]

Distribution.—CHILE: Valparaiso, 3 ♀, 1 ♂, (A. Faz), [Cornell Univ., 2 ♀; Acad. Nat. Sci. Phila., 1 ♀, 1 ♂]. Limache, 5 ♀, January 1920, (A. Faz), [Cornell Univ.]. Also many Chilean specimens in Herbst collection, Mus. Comp. Zool.

To judge from the numerous specimens that have come under my observation this is not only a frequent insect in Chile but more common than any other species of the genus, or of the tribe, in South America.

Subgenus **PHOLIDAPORUS** new subgenus

Type of subgenus: *Planiceps perpictus* Fox.

♀. Differs from *Euplaniceps* in having the claws cleft, the inner ray obliquely truncate, but slender, not broad as in certain other genera.

Euplaniceps (Pholidaporus) perpicta (Fox) new combination

1897. *Planiceps perpictus* Fox, Proc. Acad. Nat. Sci. Phila., 1897, p. 261. ♀.

♀. Black, two yellowish (buff-yellow) lateral spots on each of tergites 2 to 4, a stripe of same color on dorsum of tergite 6; calcaria white; pubescence in general black, velvety, but with much silvery pubescence as follows: on clypeus, all coxae (dense on hind pair), inner surfaces of fore legs, more or less of underparts (except middle coxae beneath and apex of abdomen); the following intensely silvery, with long, dense tomentum: a stripe from middle coxae to beneath forewings, apex of mesonotum and scutellum except margins, stripe on sides of propodeum, lower plate of metapleura and hind coxae; head, legs and pronotum with erect black hairs. Fore wings deep black, without reflection, the following milky white, with pale veins and white setae: a band involving apical third of first submarginal except tip, extreme base of second narrowed apex of first discoidal, basal half of third discoidal and of first apical cells, a bar occupying all but base and apex of median cell; hind wings with irregular hyaline and smoky areas.

Eyes inflated; inner orbits barely sinuate; head measurements: a 42, b 49, c 26, d 23, e 27, f 25, g 15, h 8, i 22; outline of head in profile nearly straight from front ocellus to area frontalis; nasus prominent, strongly raised above bases of antennae, the area frontalis sloping strongly and deeply but not

[49] I have not seen the types of this species.

quite perpendicularly to the level of the clypeus; antennal fossae deep, extending to orbits; surface of clypeus a little convex, slightly impressed below each antennal fossa, the anterior margin rounding laterally but almost truncate at middle; mandibles with one inner tooth and a short acute tooth on inferior margin; frontal fissure a finely impressed line on raised part of nasus; front ocellus in a depression, vertex depressed laterad of each hind ocellus, raised between them and with a median furrow; posterior margin of head truncate, with a weak bordering ridge; ocellar measurements: a 9, b 9, c 24, d 24. Antennal measurements: 12:3.5:12:10.

Slender, abdomen compressed; dorsal measurements: a 4, b 4, c 27; dorsal surface of pronotum not margined laterally; streptaulus weak medially, deeply impressed laterally, extending to anterior one-third of side-pieces of pronotum; a deep, curved groove in front of and above spiracular tubercles; metapostnotum exposed, vertical at sides, striate; mesosternum rounded posteriorly, not at all laminate. Front femora one-half as wide as long; posterior margin of under surface of front tibiae devoid of spines, a few minute spinules at apex; no lateral spines on tarsi; front claws bifid, the rays close and parallel, the inner shorter, acute, the outer but little curved, obtuse; hind and middle claws differing from front ones in that rays are a little farther apart, the inner ray, although still slender, obliquely truncate; longer hind tibial spur two-fifths as long as metatarsus. Length, 19 mm.[50]

Distribution.—BRAZIL: Matto Grosso.—Chapadá, [*type,* Carnegie Museum].

Species of Euplaniceps unknown to the Author

Euplaniceps ornatula (Dalle Torre) new combination

1869. *Planiceps ornatus* Taschenberg, Zeitschr. f. d. Ges. Naturw., XXXIV, p. 69. ♀. [Argentina: Santiago del Estero.]. Misidentification.
1897. *Pompilus ornatulus* Dalle Torre, Catal. Hymen., VIII, p. 308.

♀. Black, tergites 2 and 3 with lateral rosy spots, and the dorsum of last tergite rosy; velvety, sides of propodeum, mesonotum in part, hind coxae, anterior tibiae and tarsi within, and tergites 4 and 5 silvery-sericeous. Fore wings black, the apex, a band, and median cell hyaline; hind wings hyaline with infuscated apex. Length, 17 mm.

Since Taschenberg did not propose *ornatus* as a new species of *Planiceps,* but misidentified Klug's *Pompilus ornatus* and thereby mistakenly applied it to a *"Planiceps,"* the name is not valid for the latter but will be replaced by *ornatulus* Dalle Torre.

Distribution.—ARGENTINA: Santiago del Estero.

[50] Described from specimens bearing Fox's handwritten labels "type."

Euplaniceps quadrimaculata (Smith) new combination

1873. *Aporus quadrimaculatus* Smith, Ann. and Mag. Nat. Hist., (4), XII, p. 53. [Brazil: Pará.]
1897. *Pompilus quadrimaculatus* Dalle Torre, Catal. Hymen., VIII, p. 314.

♀. Black with a large ovate white spot on each side of tergites 2 and 3 and tergite 6 white or yellowish white; head and segments 1 to 5 of antennae underneath fulvous; calcaria white; posterior margin of scutellum, postscutellum, propodeum, coxae and femora covered with glittering silvery pile. Fore wings dark fuscous, with a hyaline fascia at apex of first submarginal cell, median cell also hyaline and extreme apex of wings pale; posterior wings hyaline with a faint cloud at apex. Length, 12 mm.

Distribution.—BRAZIL: Pará.—Belem and Santarem.

Euplaniceps variipennis (Perty)

1833. *Planiceps variipennis* Perty, Delect. Anim. Artic. Brazil, p. 143. [Brazil.]
1897. *Pompilus variipennis* Dalle Torre, Catal. Hymen., VIII, p. 331.
1930. *Euplaniceps variipennis* Haupt, Mitt. Zool. Mus. Berlin, XVI, p. 751.

♀. Black, tergites 2, 3 and 4 with a white spot on each side, the last tergite with a dorsal yellowish white spot; propodeum silvery sericeous. Anterior wings hyaline, with two broad fuscous bands; posterior wings hyaline.

Euplaniceps venusta (Guérin-Méneville) new combination

1844. *Planiceps venustus* Guérin-Méneville, Iconogr. Règne Animal de G. Cuvier, Insectes, p. 434. [Argentina.]
1897. *Pompilus venustus* Dalle Torre, Catal. Hymen., VIII, p. 332.

♀. Black, tergites 2 and 3 each with large, yellow, lateral spots, last tergite red; velvety, front, scutellum and sides of propodeum with greyish yellow pubescence. Fore wings black, with two yellow bands; hind wings transparent. Length, 15 to 16 mm.

According to Schulz the type is in Gribodo's collection in Turin.

Distribution.—URUGUAY: Maldonado. ARGENTINA: Buenos Aires, and Patagonia.

Species of Aporini of Uncertain Generic Position

Dryinus auripennis (Fabricius)

1804. *Dryinus auripennis* Fabricius, Syst. Piez., p. 200. ♀. [Amer. Merid.]
1912. *Planiceps auripennis* Schulz, Berl. Ent. Zeitschr., LVII, p. 80.

♀. Black, abdomen red, immaculate; front wings yellow, posterior wings hyaline. Length, 10 mm.

Aporus minutus Smith

1873. *Aporus minutus* Smith, Ann. and Mag. Nat. Hist., (4), XII, p. 53. ♂. [Brazil: Pará.]
1897. *Pompilus minutissimus* Dalle Torre, Catal. Hymen., VIII, p. 302.

♂. Black, with thin white pubescence and fusco-hyaline wings. Calcaria elongate; propodeum with rounded apex. Length, 4 mm.

This species seems most likely to belong to the subgenus *Notoplaniceps* of *Aporus,* and may be synonymous with *fenestralis.*

Dryinus planifrons (Fabricius)

1804. *Dryinus planifrons* Fabricius, Syst. Piez., p. 201. ♀. [Amer. Merid.]
1912. *Planiceps planifrons* Schulz, Berl. Ent. Zeitschr., LVII, p. 80.

♀. Black, with cinereous pubescence and fuscous wings.

Schulz suggests that this may be a synonym of what Fox determined as *canescens* Smith, which is the species named *fenestralis* in this paper. At any rate it seems likely to be a member of the subgenus *Notoplaniceps.*

Tribe Epipompilini

1930. Epipompilini Haupt, Mitt. Zool. Mus. Berlin, XVI, pp. 724 and 759.

Haupt established this tribe for two Neotropical and six African genera. Arnold later removed the latter, erecting for them the tribe Idopompilini. Haupt's characterization of the group is vague. The species seem to be extremely rare; in all the Neotropical material of the great collections that I have examined I have observed only two specimens. No males have been recognized.

Distribution.—Neotropical Region, according to Kohl also the Australian.

Key to the Genera of Epipompilini

Females

Eyes bare; clypeus truncate, the labrum concealed.....**Epipompilus** Kohl
Eyes strongly hairy; clypeus emarginate, the labrum exposed
Aulocostethus Ashmead

AULOCOSTETHUS Ashmead

1902. *Aulocostethus* Ashmead, Can. Ent., LIV, p. 133.
1930. *Aulocostethus* Haupt, Mitt. Zool. Mus. Berlin, XVI, p. 763, figs. 64, 65, and 84J.

Type of genus: *A. bifasciatus* Ashmead, by original designation.

♀. Head not lenticular, width of head seen from in front one and one-quarter times its length (from upper margin to apical margin of clypeus), width of an eye at center of emargination to width of front between the eyes at same level as 7:21; inner margins of eyes parallel below, rather strongly emarginate above, convergent at summit; from side view (see Haupt's fig. 65),[51] the front strongly evenly convex; the antennal sockets vertical, the spatium frontale descending perpendicularly between the antennae to the level of the area frontalis and clypeus; no antennal fossae, the convexity of the front above antennae extending evenly to the eyes, and the transverse linear face between antennae and clypeus flat and on same plane as clypeus with which it is continuous; clypeus transverse (width to median length as 18:4) not reaching laterally to eyes, nearly flat but slightly convex from side to side, its basal suture sinuate to pits at sides, sloping from pits obliquely outward to point of its greatest breadth, from there the anterior margin forming a strongly rounded lobe on each side, broadly and rather deeply emarginate in the middle, exposing the labrum which is more than one-half as long as clypeus and in the same plane; a distinct but not long malar space; mandibles short, curved and stout, the lower margin without emargination, the inner margin with a deep notch subtended by a blunt tooth, the surface without strong setae, the lower condyle produced vertically to the level of the gena; antennal sockets close together but not touching, their lower margins approximately one-seventh as far above a line connecting the lower limits of the eyes as the inner margins of the latter are apart at their level; from above the head strongly convex in front, nearly truncate behind; occipital surface vertical, distinct; front and vertex notably short-pubescent, eyes noticeably hairy under even low power. Palpi long and slender (see Haupt's fig. 65),[51] the inner margin of penultimate segment of labial palpi produced so that the shape of this segment is broadly pyriform; labium and maxillae devoid of setae; scape spindle-shaped, neither flattened nor bent, noticeably silky-pubescent; pedicel long, proportion of length to apical width as 13:10.

Collar (see Haupt's fig. 65) not elevated medially, attached to hind surface of head far below the upper margin of same so that the occipital surface is extensive, the pronotum declines abruptly (not abruptly in *excelsus*) from the dorsal surface to the collar, no less in the middle than at sides, so that there is a short nearly vertical face; proportions: length of pronotum 20 (excluding collar 15), mesonotum 22, scutellum 11, metanotum 3, metapost-

[51] Mitt. Zool. Mus. Berlin, XVI, 1930.

notum 1, propodeum 27, greatest width of pronotum 33; pronotum strongly margined laterally in *aztecus,* not in *excelsus;* no trace of streptaulus; lateral furrows present but no others on mesonotum; a small round pit on each side of median lobe of metanotum, the surface laterad of this, flat; metapostnotum exposed, in a deep incision, its median part oblique to almost vertical, not more shortened in extreme center, finely transversely striate; front coxae ending far forward of middle coxae in *aztecus,* not in *excelsus;* mesosternum ending in two lobes that are in juxtaposition, separated by a short slit. Propodeum with evenly rounded contour, no humps or tubercles, the dorsal surface rounding gradually into the oblique posterior surface; spiracles large, straight, oblique, with pronounced lips but not preceded by a tubercle. Abdomen fusiform, the base of the first segment forming a short petiole, less noticeable in *excelsus.*

Wings hyaline, the front pair bifasciate with fuscous (see Haupt's fig. 64). The hind pair fuscous at apex; three submarginal cells, the 2nd and 3d each receiving a recurrent vein near the middle; 3d submarginal trapezoidal, much wider at apex than at base; basal and transverse median veins in fore wing opposite one another; cubital vein of hind wing arising far beyond transverse median vein. Front femora swollen, proportion of length to greatest width as 31:12; front tibiae devoid of spines, tarsi with a few setae but no distinct spines, but with apical adhesion discs, segments except 4th not transverse, the last one large and stout; the fan between the claws consisting of about a dozen slender long setae; the empodium very large; claw straight to near apex, where it is rather suddenly bent almost at a right angle, the inner tooth placed well toward the apex, and nearly parallel to the outer ray, yet not so as to appear bifid (see Haupt's fig. 84J); the middle and hind claws nearly the same; hind femora and tibiae devoid of spines, even at apex; tarsal segments with fine spines beneath, in *excelsus* also above; apical segment devoid of spines.

Distribution.—Neotropical Region: Mexico to Brazil.

Key to the Species of the Genus Aulocostethus

Females

1 a. Abdomen partly red.....2
  b. Abdomen black, 2nd tergite bimaculate with white, and the 5th with a basal white band; middle and hind legs and a small portion of fore legs black; thorax and propodeum (except tip) red; upper surface of hind tibiae not obviously spinose.....**aztecus** (Cresson)
2 a. Tergites 1 and half or all of 2 red, 4, 5, and 6 black, but 5 and sometimes 6 with white marks; at least anterior half of thorax black.....3
  b. Tergites 1, 3, and 4 black, 2, 5, and 6 red; thorax wholly red; upper surface of hind tibiae with very short, scattered spines
bifasciatus Ashmead

3 a. Antennae red, dusky at apex; propodeum, one-half of pleura, middle and hind legs, and front tibiae and tarsi red; tergite 3 and one-half of 2 black; no white on tergite 6; upper surface of hind tibiae spinose **excelsus** new species

b. Antennae black; propodeum black, but a cream-colored spot occupying its sides, much of pleura and lateral surfaces of middle and hind coxae; legs otherwise black, except bases of hind femora and white spots on hind tibiae; hind tibiae unarmed.....**haupti** Arlé

Aulocostethus aztecus (Cresson) new combination

1869. *Ferreola azteca* Cresson, Proc. Boston Soc. Nat. Hist., XII, p. 376. ♀. [Mexico: Vera Cruz.]

1893. *Pompilus aztecus* Cameron, Biol. Centr.-Amer., Hymen., II, p. 189.

1902. *Epipompilus azteca* Ashmead, Can. Ent., XXXIV, p. 133. Misidentification.

♀. Brick-red: Face except sides, clypeus, labrum, mandibles, scape, pedicel (the underside of basal segments of flagellum reddish), thorax (except apex of mesosternum), propodeum except apical face, front legs (except tarsi). White: Large spot on each side of tergite 2, basal band on 5, terminal carina of propodeum, hind coxae above and apically, basal stripe on upper surface of hind tibiae, hind and middle calcaria; otherwise dead black. Head and pronotum with rather long and abundant woolly white pubescence, elsewhere pubescence shorter, white; no erect longer hair. Fore wings hyaline with a fuscous band crossing apex of median and submedian cells, before apex of anal cell, extreme base of 1st submarginal and base of 1st and 2nd discoidal cells; a broader band occupying entire marginal cell and extending to anal angle; hindwings hyaline, fuscous at apex.

Head measurements: a 32, b 39, c 18, d 20, e 23, f 20, h 7, i 18. Eyes swollen, densely hairy, occupying vertex and reaching hind margin of head laterally; front in profile evenly convex from front ocellus to spatium frontale which is not distinct; area frontalis perpendicular; no antennal fossae, the surface at sides and below the antennal sockets flat, and in a plane with the almost flat clypeus; antennal sockets approximate; anterior margin of clypeus emarginate; labrum exposed, semicircular; mandibles broader, the inner margin with a single large tooth, outer margin simple; malar space one-half as long as pedicel; frontal fissure a finely impressed line extending nearly one-third of distance from area frontalis to anterior ocellus; ocelli not in depressions, lying flat on surface; hind margin of head truncate, the vertex rounding into occipital face without any ridge; ocellar measurements: a 14, b 18, c 20, d 11. Antennal measurements: 10:4:10:12.

Dorsal measurements: a 23, b 33, c 20; sides of dorsal surface of pronotum strongly convergent anteriorly, strongly but not acutely margined; dorsal surface long and almost at right angles to the short vertical anterior surface; collar equally depressed all the way across; streptaulus wanting and no marked depression in front of spiracular tubercles, although the entire lateral pieces of pronotum are markedly concave; metapostnotum less

than one-half as long as postscutellum, not twisted into a perpendicular position laterally, finely striated, in an incision but fully exposed throughout; propodeum rounded, with oblique posterior surface, finely granulate, with even contours, large straight spiracles, and no tubercles; mesosternum laminate, the two laminae closely appressed, divided by a median fissure. Front femora strongly incrassate, length to width as 31:12; front tibiae and metatarsi not spinose; last segment of tarsi with only apical spines; hind femora without spinules or spine pits; hind tibiae without even apical spines; hind metatarsus with minute spines on its surface; front and middle claws similar, broad and long with the apical ray strongly curved, its length about equal to that of the acute inner tooth, the empodium very large, longer than claws, bilobed; hind claws more slender, the outer ray curving until perpendicular, it and tooth long and slender, the empodium not unusually large. Length, 13 mm.[52]

Ashmead quite incorrectly synonymized *Ferreola azteca* Cresson with *Epipompilus maximiliani* of Kohl. Cresson's type before me does not at all agree with Kohl's description of *maximiliani,* nor does it belong to the genus *Epipompilus.* Haupt[53] accepted the synonymy given by Ashmead and knowing neither species quoted Kohl's description of *maximiliani* as a description of *azteca* Cresson, to which it by no means applies.

Distribution.—MEXICO: Vera Cruz, 1 ♀, [*holotype,* Acad. Nat. Sci. Phila.].

Aulocostethus excelsus new species

♀. Head black, the antennae reddish ferruginous, dusky at apex and the extreme tips of all but basal segments blackened; prothorax, mesocutum, base of scutellum, upper plate of mesopleura (except posterior margin) and mesosternum black, remainder of thorax and propodeum clear reddish ferruginous; basal segment of abdomen and half of 2nd reddish ferruginous, the remainder of abdomen black, without white marks; all legs reddish ferruginous except the front coxae, the front femora to but not including the apex, and the last segment of each tarsus, which are fuscous; covered with a sparse, short, erect, cinereous pile, decumbent on sides and parts of legs where it gives a silvery sheen, but with no trace of the microscopic depressed pile that gives a purple sheen to many species of the family. Fore wings yellowish hyaline, with a broad fuscous crossband at the region of the basal vein, and another before the apex, involving the 2nd and 3rd submarginal cells and base of the fourth, this also involving the apex of hind wing which is otherwise clear hyaline; veins yellowish brown, darker on the fuscous areas; setae of wing-membrane short, sparse and fuscous.

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[52] Description drawn from the type, the only specimen known.
[53] Mitt. Zool. Mus. Berlin, XVI, p. 762, 1930.

Frontal fissure impressed, ending above in a pit. Dorsal surface of pronotum not margined laterally. Front coxae long, reaching about to middle coxae; empodia much shorter than in *aztecus,* not reaching the apex of the claws; upper surface of hind tibiae with short, fine, erect spines. Base of first segment of abdomen less petioliform than in *aztecus.* Length, 10 mm.

Holotype.—Female, Nova Teutonia, Santa Catharina, Lat. 27° 11′ S., Long. 52° 23′ W., Brazil, January 25, 1939, (Fritz Plaumann), [Mus. Comp. Zool.].

Aulocostethus haupti Arlé

1936. *Aulocosthethus haupti* Arlé, Festschr. für Embrik Strand, I, p. 514, figs. 1–4. ♀.

♀. Black, the first two segments of the abdomen and part of the 3rd red; bases of the femora of the hind legs red; a large, yellowish white spot occupies the following lateral parts: hind part of mesopleura, greater part of metapleura, lateral faces of the propodeum, and lateral surfaces of middle and hind coxae; two yellowish white spots on each of tergites 5 and 6, those of tergite 5 incompletely separated by a black spot, reniform; two yellowish white spots on inner orbits at level of the antennal sockets and two others on the bases of the hind tibiae; the inner surface of the front tibiae dark red; antennae black; a fine white pilosity on entire body and wings; eyes hairy. Wings with 2 transverse brown bands.

Head 1.3 times as broad as the pronotum; profile as in Haupt's figure of *bifasciatus;* eyes broader than high; frontal fissure evident only on its inferior part; hind ocelli situated at an equal distance from hind margin of vertex, from eyes, and from front ocellus, and 1.7 times as far from each other; antennal measurements: 20:9:20:21; clypeus short, its anterior margins lightly emarginate on its entire breadth; maxillary palpi with elongate segments, but thicker proportionately than in *bifasciatus,* proportion of length to breadth of segment 1, 2:5, of segment 2, 3:8, 3, 4:9, 4, 5:10.

Pronotum short, more than two times broader than long in its center, its side parallel, the hind margin rounded, not forming a definite angle, the sides excavated; mesoscutum about 2 times as long as pronotum in center; parapsidal furrows entire; scutellum and postscutellum convex; metapostnotum distinct but very narrow. Propodeum a little broader than long, with a fine but clear-cut transverse striation. Front tarsi without comb, the segments 1 to 4 shortened as in *bifasciatus;* hind tibiae unarmed, their apical spur reaching the middle of the metatarsus; claws with an inner acute tooth, parallel to the outer ray, which is strongly curved.[54]

Distribution.—BRAZIL: Rio de Janeiro.—Serra do Realengo, 1 ♀, October 7, 1934, (R. Arlé).

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[54] I have not seen this species.

Aulocostethus bifasciatus Ashmead

1902. *Aulocostethus bifasciatus* Ashmead, Can. Ent., XXXIV, p. 132. ♀. [Peru.]

?1930. *Aulocostethus bifasciatus* Haupt, Mitt. Zool. Mus. Berlin, XVI, p. 763, figs. 64, 65, and 84J. ♀. [Costa Rica.]

♀. Head black, the antennae, except apical half, ferruginous; thorax and propodeum ferruginous; abdomen feruginous except tergites 1, 3 and 4 black; legs ferruginous except the knee of hind femora and outer base of hind tibiae black, and the latter behind the black base as well as tips of front and hind coxae white. Wings as in *excelsus* (see Haupt's fig. 64).[55] Entirely covered with short white hair.

Front strongly convex, with distinct median groove. Dorsal surface of pronotum with pronounced lateral margins. Hind tibiae beset with very short scattered spines, the longer spur three-quarters as long as the metatarsus. First abdominal segment almost petiolate at base; second sternite with weak indication of a transverse furrow. Length, 7 mm.

Distribution.—COSTA RICA. PERU.

I have not seen a specimen of this species and the description given is taken from the fuller description of Haupt. There is no certainty that his specimen from Costa Rica is identical with Ashmead's *bifasciatus* from Peru, in fact it probably is not, but until Ashmead's type can be found or Peruvian material compared the name may be applied to the form described by Haupt.

EPIPOMPILUS Kohl

1884. *Epipompilus* Kohl, Verh. K. K. Zool.-Bot. Gesell. Wien., XXXIV, p. 57.
1902. *Epipompilus* Ashmead, Can. Ent., XXXIV, p. 133.

Type of genus: *Epipompilus maximilliani* Kohl.

I have not seen specimens of this genus, which may or may not differ from *Aulocostethus*. Kohl notes the small size of the head: "Kopf verhaltnissmassig klein," and Ashmead distinguishes it from his *Aulocostethus* by reason of its eyes not being hairy. Whether Ashmead actually knew the genus, or merely assumed that this was the case is uncertain.

Distribution.—Neotropical Region: Mexico to Panama.

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[55] Mitt. Zool. Mus. Berlin, XVI, 1930.

Key to the Species of the Genus Epipompilus

Females

Mandibles, labrum and clypeus black, legs entirely red; abdomen black, a small pale yellow spot on each side of 2d tergite and the following parts brownish ferruginous: basal spot on tergite 1, basal half of 2, apex of 4, and all of 5 and 6.....**delicatus** Turner

Mandibles, labrum and clypeus red; tarsi infuscated, hind femora at apex and hind tibiae in greater part fuscous; abdomen black, the tergite 2 with large white lateral spots and 5 with a white band **maximilliani** Kohl

Epipompilus maximilliani Kohl

1884. *Epipompilus maximilliani* Kohl, Verh. K. K. Zool.-Bot. Gesell. Wien., XXXIV, p. 57. ♀. [Mexico.]

1886. *Epipompilus maximilliani* Kohl, Verh. K. K. Zool.-Bot. Gesell. Wien., XXVI, p. 340. ♀.

1897. *Pompilus maximilliani* Dalle Torre, Catal. Hymen., VIII, p. 301.

1930. *Epipompilus aztecus* Haupt, Mitt. Zool. Mus. Berlin, XVI, p. 762. ♀. Misidentification.

♀. Head black, the mandibles, clypeus, and scape red; thorax red; abdomen black, with two white spots on tergite 2 and a white band on 5 as in *Aulocostethus aztecus;* legs red, the tarsi infuscated and the hind femora at apex and hind tibiae in greater part blackish. Wings hyaline, the forewings with 2 fuscous bands, as in species of *Aulocostethus.*

Clypeus anteriorly truncate; labrum concealed; face finely wrinkled and finely punctate (visible at 45 × magnification) like the mesothorax, the punctation of pronotum lighter and sparser; 1st segment of flagellum equal to scape; ocelli nearer eyes than to one another. Propodeum finely striolate. Length, 8 mm.

Epipompilus delicatus Turner

1917. *Epipompilus delicatus* Turner, Ann. and Mag. Nat. Hist., (8), XX, p. 359. [Panama.]

♀. Head black, the scape pale yellow, the flagellum pale brown, fuscous toward apex; thorax and propodeum reddish ferruginous; abdomen black, tergite 2 with two pale yellow spots, a basal spot on 1st tergite, the basal half of the 2nd, the apex of the 4th and the entire 5th and 6th brownish ferruginous. Wings hyaline, with two fuscous fasciae and brown veins; pubescence short, cinereous (at least on head, probably also elsewhere).

Frontal groove reaching front ocellus. Pronotum not more than one-half as long as mesonotum, the anterior margin straight, the hind margin broadly and shallowly arcuate, the sides parallel. First segment of abdomen broadened from the base. Hind tibiae unarmed. Length, 6 mm.

Distribution.—PANAMA: Bugaba, 1♀, (G. C. Champion), [*holotype,* Brit. Museum].

ALLOCHARINI new tribe

♀. Temples linear; malar space distinct; area frontalis sloping gently between antennae, the front strongly convex below; the frontal fissure weak, present on lower part of front to the upper margin of the slope; face without median carina; clypeal suture arcuate; surface of clypeus convex; labrum not exposed; mandibles slender, edentate, without grooves or setae and no lamina on inferior margin. Maxillary palpi long and slender; scape short, not flattened.

Dorsum strongly curving down anteriorly, the anterior part of the mesonotum forming more of the anterior than dorsal wall of the alitrunk; the surface of pronotum of moderate length, rounding strongly; collar depressed; streptaulus complete to humeri; metapostnotum not bilobed; propodeum with deeply concave posterior surface, the lateral margins of which are acutely dentate. Front coxae long, slender, extending beyond apex of mesosternum, without strong lamellae; middle coxae wide; legs devoid of the ordinary spines, no spinules on hind femora; claws all similar, with a long basal lamina and a short, curved, slender apical ray (see Plate IV, fig. 29). Three submarginal cells; the 2d and 3d subequal, quadrate; second discoidal cell with basal pocket; basal vein opposite the submarginal; anal vein of hind wing extending evenly without break into the median, which it joins in advance of the cubitus.

♂. General structure similar to female including propodeal teeth. Front claws asymmetric, the anterior claw being curved and with a tooth within, the posterior claw laminate like those of the middle and hind legs; longer hind tibial spurs three-quarters as long as metatarsus; one spine in articulatory emargination of front tibiae and a few spinules at apex; the middle and hind tibiae and metatarsi minutely spinulose; a single spinule in a pit near apex of upper surface of hind femur, and a few short spines of different lengths at apex of hind tibiae.

The terminal sternites (Plate IV, fig. 7) and the phallus (Plate IV, fig. 13) are described below under the only known genus.

The mandibles and shape of the coxae indicate some affiliation with the Allocyphonychini, but in the absence of spines and hair, the unique claws and the dentate propodeum, the concealed labrum, the differently proportioned palpi, and the unique structure of the terminal sternites of the male the tribe is quite divergent.

Distribution.—Neotropical Region extending into the Nearctic, Lower Austral Zone.

ALLOCHARES Banks

1917. *Allochares* Banks, Bull. Mus. Comp. Zool., LXI, p. 98.

Type of genus: *Allochares bruesi* Banks.

♀. Head seen from in front slightly broader than high (proportion 35 to 32, measured from occipital margin to apex of clypeus), the face rather narrow (at its widest four-sevenths total head-width), the inner orbits concave, converging below and more strongly above; antennal sockets nearly the length of pedicel above clypeal suture, the antennal fossae forming a single continuous depression across face below antennae; clypeus convex, broad, extending well under eyes, its lateral and anterior margins forming a continuous broad arc; mandibles long slender and tapering in an even curve to an acute tip, edentate except for a single denticulation on inner margin, not grooved nor fimbriate and without long setae, no lamella on inferior margin; maxillary palpi long and slender, the last three segments more slender than the first three, proportionate lengths of the six: 6:12:20:25:19:16; 1st two segments of labial palpi clavate, the first stalked and a little longer than the next, the last two more slender, proportionate lengths: 14:10:10:12; ocelli situated in depressions on the dorsal aspect of the head, some distance from the occipital margin, which is barely concave and almost coincident laterally with the hind margin of the eyes, there being practically no temples; eyes with dense minute hair, scarcely visible except under high power, broad and swollen, leaving a distinct malar space. Antennae long and slender, segment three six times longer than thick, one and one-half times as long as scape.

Pronotum with a moderately long dorsal surface, nearly as long medially as mesonotum, rounding gently into a short oblique anterior surface to which the collar forms a narrow anterior margin; streptaulus complete; the dorsal surface without marked lateral margin, but the vertical sides somewhat concave; parapsidal furrows weak, and lateral furrows wanting; the mesonotum posteriorly and scutellum rather flat, the latter with a strongly raised, long, and narrow median lobe, down-curved and bilobed at tip; postscutellum with only a weak median lobe; metapostnotum linear, nearly one-third the length of the postscutellum, nearly flat in center, vertical toward sides; mesosternum with V-shaped apical median notch. Postero-lateral angles of propodeum projecting backwards (in profile) as acute teeth, as seen from above forming the extremities of an arcuate emargination; and yet the posterior surface nearly flat, oblique; dorsal surface long, rounded and bilobed by reason of a rather deep median furrow; spiracles large, the surface only slightly raised over them. Abdomen broadly sessile. Three submarginal cells, the second and third each receiving a recurrent vein; submedian opposite basal vein; the cubitus in hind wing rarely arising beyond the submedian vein and curved, not angled. The legs devoid of the ordinary spines, there being only small spines at the apices of the tarsal segments and a group of three or four minute spines on the front side at the apex of the middle and hind tibiae;

front coxae long, depressed, overlying bases of middle pair; the front femora not unusually thickened; the front tarsal segments not shortened; the tibial spurs devoid of brushes except a brush of minute hair at the base of the longer hind tibial spur; the longer spur of the middle tibiae more than three-quarters, of the hind tibiae one-half the length of the corresponding metatarsus; claws forming a long broad lamina terminating in a pimple (representing the normal median tooth) beyond which they are narrowed to form a slightly curved claw. The body and appendages everywhere devoid of hair, except for a little under the head and on the propleura, but entirely covered with a minute appressed tomentum, that gives the surface a dull velvety lustre and violet blue sheen.

♂. The structure of the terminal sternites (Plate IV, fig. 7) unusual; the eighth sternite wish-bone shaped, underlying the base of the ninth; the latter forming a trough, with widely expanded sides, and a median ventral keel, membranous and hyaline except for the keel and a basal plaque which connects with the median apophysis; the under surface sparsely but regularly covered with short setae, becoming stout in a slightly chitinized area on each side of the median keel, and on a patch each side of the basal plaque.

The parameres (Plate IV, fig. 13) extending about one-quarter of their length beyond the apices of the parapenial lobes, forming slender flattened rods, parallel-sided, straight, finely hairy; the parapenial lobes slender, tapered, compressed dorso-ventrally, parallel to one another, appearing much as in *Psorthaspis* but without a ventral lamina; the volsellae spoon-shaped, with short setae on the under side of the bowl, and a group of longer setae at base; the cuspis not evident; the aedeagus lightly chitinized, transversely flattened, lanceolate.

Allochares azureus (Cresson) new combination

(Pl. IV, figs. 7, 13 and 29.)

1867. *Pompilus* (*Agenia*) *azureus* Cresson, Trans. Amer. Ent. Soc., I, p. 131. ♀. [Mexico: Vera Cruz.]

1893. *Pseudagenia azurea* Cameron, Biol. Centr.-Amer., Hymen., II, p. 167.

1893. *Pompilus sinaloae* Cameron, Biol. Centr.-Amer., Hymen., II, p. 192. ♀. [Mexico: Mazatlan.] New synonymy.

1917. *Allochares bruesi* Banks, Bull. Mus. Comp. Zool., LXI, p. 98. ♀. [Texas.] New synonymy.

♀. Entirely black with violet-blue sheen and black wings. Devoid of hair. Head measurements: a 32, b 37, c 15, d 15, e 20, f 21, h 8, i 16; ocellar measurements: a 12, b 4, c 21, d 11; antennal measurements: 12:4:15:15; dorsal measurements: a 17, b 33, c 20. Length, 8.5 to 10 mm.[56]

♂. Black, the tomentum in part showing blue-green reflection, but the greater part, especially on sides and under parts, cinereous. Wings nearly hyaline, clouded apically. Length, 8 to 9 mm.

[56] Measurements taken from the type.

Distribution.—MEXICO: 2 ♀, [Acad. Nat. Sci. Phila.]. Vera Cruz, 1 ♀, (Ch. Sartorius), [Acad. Nat. Sci. Phila., *holotype*]. Jalisco.—Volcan de Colima, 1 ♀, (L. Conrad), [Cornell Univ.]. Sinaloa.—Mazatlan, [rec. by Cameron]. Sonora, 1 ♀, December 20, 1933, (Harrison and Wilbur; on Neomamillaria, "Nogales No. 3855. Hymen. lot no. 10192"), [U. S. Nat. Mus.]. TEXAS: Uvalde Co.—Sabinal, 1 ♀, April 1910, (F. C. Pratt), [U. S. Nat. Mus.]. FLORIDA: Jacksonville, 1 ♂, [U. S. Nat. Mus., *allotype*]. Orlando, 2 ♀, (F. L. Van Dauber), [Cornell Univ.; U. S. Nat. Mus.].

ALLOCYPHONYCHINI new tribe

♀. Temples linear; malar space long; spatium frontale oblique; a short carina on area frontalis, continued above as a short impressed frontal fissure; face without median carina; clypeal suture arcuate; surface of clypeus convex; labrum fully exposed; mandibles slender, with one inner tooth, without fimbriate grooves or lamella on lower margin; segments of maxillary palpi slender but not elongate; scape short, not flattened. Profile of dorsum with a continuous gentle curve, the dorsal surface of pronotum distinct, but transverse, the anterior surface vertical; collar deeply depressed, streptaulus complete to humeri; metapostnotum bilobed. Front coxae slender, extending beyond apex of mesosternum, with apical lamellae; middle coxae very wide; front femora not incrassate; tibiae spinose beneath and at tip; no tarsal comb, but a median comb underneath of short spines; ultimate tarsal segments with only apical spines underneath; claws similar, bifid, the inner ray truncate. Wings with three marginal cells; the second discoidal with a basal pocket.

♂. Antennae strongly crenulate; further characters given under genus.

Distribution.—Nearctic Region, Austral Zone.

In describing *Allocyphonyx,* the only genus of this tribe, Ashmead adjoined it to *Notocyphus* to form the tribe Notocyphini of his subfamily Notocyphinae. Subsequently it has been placed among the Pompilinae [Psammocharinae], of which it forms a strongly divergent element.

ALLOCYPHONYX Ashmead

1902. *Allocyphonyx* Ashmead, Can. Ent., XXXIV, p. 136.

Type of genus: *Pompilus maurus* Cresson. (By original designation.)

♀. Temples linear; eyes large, inflated, bare, extending onto top of head, their inner margins nearly parallel, a little concave; malar space as long as scape; antennal sockets only slightly inclined, far above lower level of eyes, the lower part of the spatium frontale with a short median carina ending in a tubercle above, from which the frontal fissure extends upwards as an impressed line less than half way to ocellus, and continues faintly to it; no median carina on face; the antennal fossae not strongly impressed and fully confluent; clypeal suture strongly arcuate; surface of clypeus evenly convex to the very base, its apical margin shallowly emarginate; labrum convex, a little broader than semicircular; the second segment of maxillary palpi the longest, a little longer than the first, the others subequal in length; apical three segments of labial palpi slender, short; the posterior margin of vertex rounding, the hind surface nearly flat; occipital carina clearly visible. Scape short, barrel-shaped; segments of flagellum slender.

Profile of dorsum not strongly convex, nor strongly decurved anteriorly, the mesonotum and dorsal surface of pronotum forming a continuous but gentle curve, yet not as flat as in *Ctenoceratini,* dorsal surface moderately long, yet strongly transverse, not margined laterally, its lateral margins seen from above, straight, converging anteriorly, the humeri not prominent, the anterior lower part of the pronotal side-pieces flaring out markedly; anterior surface of pronotum nearly vertical, rounding into the dorsal; collar at a much lower level than the dorsum, produced under the concave occiput; streptaulus complete to the humeri, absent from the side-pieces of the pronotum and no depression in front of the spiracular tubercle; median lobe of scutellum liguliform, nearly flat, decurved at apex, the median lobe of the postscutellum scarcely convex, much lower than scutellum; metapostnotum flat and expanded as a lobe on each side of median line, laterally contracted and transversely linear; apex of mesosternum with two small depressed laminae, covered by the long front coxae. Propodeum with even contours, the dorsal surface long, without median groove, but with oblique lateral subapical grooves; the posterior face vertical, low, the postero-lateral rim at its base strongly developed and with a deep pit at side. Abdomen not compressed.

Front coxae long and middle pair wide, all coxae with unusually pronounced lateral fossae for reception of the withdrawn legs, and with correspondingly enlarged projecting laminae; front femora slender; a long spine on knee-joint in front; front tibiae with a row of strong spines on front margin of upper surface, and two rows of spinules lower down on front surface, the lower margin of posterior surface with about three spines, before, and a long spine in the margin of the articulatory incision; the apex with sharp spike-like spines and spinules; tarsal segments 1 to 4 with a median comb of short spines, also with long apical spines; metatarsus with a long spine at middle of posterior side and a shorter one on anterior; hind femora with a preapical row of four spinules in pits on upper surface, the knee with a short spine in front; upper surface of hind tibiae with two

rows of spines; ultimate tarsal segments devoid of spines beneath, except apical pair; all claws similar, bifid, the inner ray broader and obliquely truncate.

Three submarginal cells; the submedian vein a little apicad of the basal vein; second discoidal cell with a basal pocket; cubital vein of hind wing arising opposite submedian vein; a stump of apical section of anal vein beyond apex of submedian cell.

♂. Differs from the female in the profile of the dorsum which is more strongly curved, the head thrust further down, the dorsal and vertical surfaces of the pronotum less differentiated, and in the antennae; scape with front and lateral surfaces flattened, the flagellum strongly crenulate, each segment beyond the first being set with its base jutting obliquely beyond the lower side of the apex of the preceding.

Abdomen compressed, the apical tergites enveloping the sternites; sternite 7 (6) with deeply concave lateral margin, 9 (apparent 7) narrow, spatulate, with dense bristly hair on upper surface especially at apex. Parameres very long, slender, flattened, with strongly ciliate margins; aedeagus with a long slender stalk and large spatulate apex, not visibly bilobed; parapenial lobes long, slender, rod-like but slightly flattened, lying along side of the aedeagus and of equal length; volsellae as long as the aedeagus, slender at base, flat, much widened and moderately twisted toward apex, their under surface densely bristled; cuspis small, bristled.

Allocyphonyx maurus (Cresson)

1867. *Pompilus maurus* Cresson, Trans. Amer. Ent. Soc., I, p. 88. ♀, ♂.
1902. *Allocyphonyx maurus* Ashmead, Can. Ent., XXXIV, p. 136.

Distribution.—Lower and Upper Austral Zones, perhaps also entering the Transition, from Tex. & s. Fla. north to Mass., c. N. Y., W. Va., Ks. & Col.

Allocyphonyx albocaudatus (Malloch) new combination

1928. *Pedinaspis albocaudata* Malloch, Proc. Ent. Soc. Wash., XXX, p. 101. ♂. [Arizona.]

I have not seen a specimen of this species, but Mr. Banks, who has seen the type, advises me that it is a valid species of *Allocyphonyx,* and he should be accredited as authority for the transfer.

Index to Tribes, Genera, and Species

Synonyms, including misspellings and emendations, as well as names referring to misidentifications are italicized. The page is indicated only for the principal references to each name, exclusive of its use in keys.

aequus, Pompilus 52
albocaudatus, Allocyphonyx ... 152
albocaudatus, Pedinaspis 79
Allaporus 118
Allochares 148
Allocharini 147
Allocyphonychini 150
Allocyphonyx 150
alternata, Psorthaspis 69
anomalus, Chelaporus 117
anomala, Pedinaspis 79
antennalis, Pedinaspis mariae .. 74
antillarum, Planiceps 107
Aporida 79
Aporinae 79
Aporinellus 28, 29
Aporini 79
Aporus 86, 88
Aspidaporus 122
assimilis, Aporus luxus 91
Aulocostethus 140
aureolus, Odontaporus 115
auripennis, Dryinus 138
australis, Psorthaspis 57
avinoffi, Psorthaspis 49
aztecus, Aulocostethus 142
aztecus, Epipompilus 146
azureus, Allochares 149
banksi, Psorthaspis 55
bellus, Rhabdaporus 121
bequaerti, Aporus 95
bifasciatus, Aulocostethus 145
bioculata, Psorthaspis 70
bombinator, Pompilus 61
brimleyi, Psorthaspis 63
bruesi, Allochares 149
bucephala, Pedinaspis 52
bugabensis, Psorthaspis 72
calcaratus, Aporus 97
canescens, Planiceps 101
canescens, Aporus 101
canipennis, Psorthaspis 71
capucinus, Pompilus 79
cariborum, Aporus 106
Chalcochares 29
Chelaporus 116
Claveliinae 30
clericus, Pompilus 92
coelestis, Psorthaspis 46
collaris, Drepanaporus 109
colombiae, Psorthaspis 47
compressus, Planiceps 92
comptus, Odontaporus 116
concolor, Planiceps 92
concolor, Aporus 97
conocephala, Psorthaspis 67
contiguus, Parapompilus 65
Cosmiaporus 108
cressoni, Psorthaspis 59
Ctenoceratini 30
Ctenocerinae 30
Ctenocerus 34
cubensis, Planiceps 109
cupripennis, Odontaporus 111
delicatus, Epipompilus 146
diverticulus, Cosmiaporus 108
Drepanaporus 109
Dromopompilus 34
dubius, Planiceps 92
elegans, Psorthaspis 74
Epipompilini 139
Epipompilus 145
eubule, Psorthaspis 78
euferalis, Planiceps 106
euferalis, Odontaporus 112
euferatis, Melanaporus 112
Euplaniceps 124, 127
excelsus, Aulocostethus 143
falco, Pompilus 109
fenestralis, Aporus 101
feralis, Planiceps 92
Ferreola 32
formosa, Ferreola 68
formosa, Psorthaspis 58

guatemalae, Psorthaspis 43
Gymnochares 29
haupti, Aulocostethus 144
herbertii, Euplaniceps 128
hermes, Aporus 94
hesperus, Planiceps 120
hirsutus, Aporus 99
hispaniolae, Psorthaspis 50
Idopedinaspis 32
impudica, Psorthaspis 72
innotatus, Aporus 103
jugosus, Aspidaporus 122
lacordairei, Pompilus 130
lacordairii, Euplaniceps 130
laevifrons, Ferreola 59
laevifrons, Parapompilus 59
laevifrons, Psorthaspis 45
legata, Psorthaspis 76
levifrons, Pompilus 45
levis, Psorthaspis 43
luctuosa, Psorthaspis 76
luxus, Aporus 90, 91
macronotum, Psorthaspis 44
magna, Psorthaspis 67
margaretella, Cryptocheilus 79
margaretella, Pedinaspis 79
mariae, Psorthaspis 74
maurus, Allocyphonyx 152
maximilliani, Epipompilus 146
Melanaporus 86, 110
minimus, Aporus 120
minor, Planiceps 92
minusculus, Aspidaporus 123
minutissimus, Pompilus 139
minutus, Aporus 139
morosa, Psorthaspis 42
nahuatlensis, Psorthaspis 46
Nannopompilus 30, 33
naomi, Psorthaspis 73
Neoplaniceps 104
niger, Aporus 92
nigriceps, Psorthaspis 51
notabilis, Odontaporus 114
Notoplaniceps 100
Odontaporus 110
ornatula, Euplaniceps 137
ornatus, Planiceps 137
Parapompilus 32
Pedinaspini 29, 30
Pedinaspis 32
Pedinaspis 33, 35
perpicta, Euplaniceps 136
petulans, Euplaniceps 133
Pholidaporus 136
picta, Psorthaspis 68
planata, Psorthaspis 52
Planicepini 79
Planiceps 32, 86
Planiceps 107
planifrons, Dryinus 139
Plectraporus 97
Pompilini 28, 29
Pompilus 32, 86, 107
portiae, Psorthaspis 56
portici, Pedinaspis 56
prolixus, Aporus 105
Psorthaspis 32
pulchella, Planiceps 120
pulchritarsis, Aporus 97
punctata, Euplaniceps 131
purpureipennis, Pompilus 48
purpuripennis, Psorthaspis 48
quadrimaculata, Euplaniceps ... 138
Rhabdaporus 121
rufiventricosus, Pompilus 120
rufiventris, Allaporus 120
sanguinea, Psorthaspis 65
saussurei, Euplaniceps 134
sima, Euplaniceps 133
simulatrix, Odontaporus 113
sinaloae, Pompilus 149
Sophropompilus 30, 33
tarsalis, Aporus 104
telemon, Pompilus 45
texana, Psorthaspis 64
troglodytes, Pompilus 109
tumifrons, Sophropompilus 52
unicolor, Psorthaspis 79
varia, Euplaniceps 129
variegata, Psorthaspis 73
variipennis, Euplaniceps 138
variipennis, Planiceps 134
venusta, Euplaniceps 138
venustus, Planiceps 121
vicina, Psorthaspis 61
yavapai, Aporus 95
zapotecus, Aporus 96
zikani, Planiceps 130

Explanation of Figures [57]

Lettering, when used on figures of the genitalia, indicates parts as follows: (a) parapenial lobe; (b) volsella; (c) paramere; (d) aedeagus.

Figures of sternite IX represent the complete sternite, after dissection.

Plate III

Fig. 1.—*Psorthaspis levis* new species. Sternite IX of ♂ (holotype), dorsal aspect.

Fig. 2.—*Psorthaspis nahuatlensis* new species. Sternite IX of ♂ (holotype), dorsal aspect.

Fig. 3.—*Psorthaspis avinoffi* (Banks). Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 4.—*Psorthaspis planata* (Fox). Sternite IX of ♂, dorsal aspect.

Fig. 5.—*Psorthaspis australis* (Banks). Sternite IX of ♂, dorsal aspect.

Fig. 6.—*Psorthaspis cressoni* new species. Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 7.—*Psorthaspis vicina* (Cresson). Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 8.—*Psorthaspis magna* (Banks). Sternite IX of ♂, dorsal aspect.

Fig. 9.—*Psorthaspis conocephala* new species. Sternite IX of ♂, dorsal aspect.

Fig. 10.—*Psorthaspis mariae* (Cresson). Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 11.—*Psorthaspis legata* (Cresson). Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 12.—*Psorthaspis levis* new species. Sternite IX of ♂ (holotype), left profile.

Fig. 13.—*Psorthaspis nahuatlensis* new species. Sternite IX of ♂ (holotype), left profile.

Fig. 14.—*Psorthaspis avinoffi* (Banks). Sternite IX of ♂ (allotype), left profile.

Fig. 15.—*Psorthaspis australis* (Banks). Sternite IX of ♂, left profile.

Fig. 16.—*Psorthaspis cressoni* new species. Sternite IX of ♂ (allotype), left profile.

Fig. 17.—*Psorthaspis vicina* (Cresson). Sternite IX of ♂ (allotype), left profile.

Fig. 18.—*Psorthaspis magna* (Banks). Sternite IX of ♂, left profile.

Fig. 19.—*Psorthaspis conocephala* new species. Sternite IX of ♂ (holotype), left profile.

Fig. 20.—*Psorthaspis legata* (Cresson). Sternite IX of ♂ (allotype), left profile.

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[57] Plate IV, figures 14, 30, and 32 were drawn by the author, all the others by Miss J. E. Edmonson, in some instances with modifications by the author.

Fig. 21.—*Psorthaspis mariae* (Cresson). Sternite IX of ♂ (allotype), left profile.

Fig. 22.—*Psorthaspis planata* (Fox). Genital capsule of ♂. Dorsal aspect of right half, basal ring omitted.

Fig. 23.—*Psorthaspis mariae* (Cresson). Left volsella of ♂ (allotype), ventral aspect.

Fig. 24.—*Psorthaspis legata* (Cresson). Left volsella of ♂ (allotype), ventral aspect.

Fig. 25.—*Psorthaspis levis* new species. Right paramere of ♂ (holotype), right profile.

Fig. 26.—*Psorthaspis nahuatlensis* new species. Right paramere of ♂ (holotype), right profile.

Fig. 27.—*Psorthaspis australis* (Banks). Right paramere of ♂, right profile.

Fig. 28.—*Psorthaspis cressoni* new species. Right paramere of ♂ (allotype), right profile.

Fig. 29.—*Psorthaspis vicina* (Cresson). Right paramere of ♂ (allotype), right profile.

Fig. 30.—*Psorthaspis magna* (Banks). Right paramere of ♂, right profile.

Fig. 31.—*Psorthaspis conocephala* new species. Right paramere of ♂ (holotype), right profile.

Fig. 32.—*Psorthaspis mariae* (Cresson). Right paramere of ♂ (allotype), right profile

Fig. 33.—*Psorthaspis legata* (Cresson). Right paramere of ♂ (allotype), right profile.

PLATE IV

Fig. 1.—*Aporus* (*Aporus*) *luxus assimilis* (Banks). Sternite IX of ♂, dorsal aspect.

Fig. 2.—*Aporus* (*Aporus*) *niger* (Cresson). Sternite IX of ♂, dorsal aspect.

Fig. 3.—*Aporus* (*Aporus*) *hermes* new species. Sternite IX of ♂ (allotype), dorsal aspect.

Fig. 4.—*Drepanaporus collaris* (Cresson). Sternite IX of ♂, dorsal aspect.

Fig. 5.—*Odontaporus notabilis* (Smith). Sternite IX of ♂, dorsal aspect.

Fig. 6.—*Chelaporus anomalus* (Banks). Sternite IX of ♂, dorsal aspect.

Fig. 7.—*Allochares azureus* (Cresson). Sternites VIII and IX of ♂, dorsal aspect.

Fig. 8.—*Drepanaporus collaris* (Cresson). Sternite IX of ♂, left profile.

Fig. 9.—*Chelaporus anomalus* (Banks). Sternite IX of ♂, left profile.

Fig. 10.—*Chelaporus anomalus* (Banks). Genital capsule of ♂ (allotype), dorsal aspect of right half of the basal ring omitted. Broken line on paramere indicates the edge of a hyaline area.

Fig. 11.—*Chelaporus anomalus* (Banks). Right volsella of ♂ (allotype), ventral aspect.

Fig. 12.—*Allaporus rufiventris* (Cresson). Genital capsule of ♂, dorsal aspect of right half.

Fig. 13.—*Allochares azureus* (Cresson). Genital capsule of ♂, dorsal aspect of right half, basal ring omitted.

Fig. 14.—*Aspidaporus minusculus* new species. Genital capsule of ♂ (holotype), dorsal aspect of right half, basal ring omitted.

Fig. 15.—*Euplaniceps saussurei* (Kohl). Genital capsule of ♂, dorsal aspect of right half, the basal ring omitted.

Fig. 16.—*Drepanaporus collaris* (Cresson). Right volsella of ♂, dorsal aspect.

Fig. 17.—*Odontaporus notabilis* (Smith). Genital capsule of ♂, right lateral aspect, basal ring omitted.

Fig. 18.—*Aporus* (*Neoplaniceps*) *tarsalis* (Ashmead). Genital capsule of ♂ (probably of paratype), right lateral aspect.

Fig. 19.—*Aporus* (*Plectraporus*) *hirsutus* (Banks). Genital capsule of ♂, ventral aspect, the basal ring omitted.

Fig. 20.—*Aporus* (*Aporus*) *luxus assimilis* (Banks). Right paramere of ♂, right profile.

Fig. 21.—*Aporus* (*Aporus*) *niger* (Cresson). Right paramere of ♂, right profile.

Fig. 22.—*Aporus* (*Aporus*) *hermes* new species. Right paramere of ♂ (allotype), right profile.

Fig. 23.—*Drepanaporus collaris* (Cresson). Right paramere of ♂, right profile.

Fig. 24.—*Psorthaspis cressoni* new species. Front and vertex of ♀ (paratype), cephalic aspect.

Fig. 25.—*Psorthaspis cressoni* new species. Front and vertex of ♂ (paratype), cephalic aspect.

Fig. 26.—*Psorthaspis vicina* (Cresson). Head of ♀, cephalic aspect.

Fig. 27.—*Psorthaspis vicina* (Cresson). Front and vertex of ♂, cephalic aspect.

Fig. 28.—*Psorthaspis vicina* (Cresson). (a) Anterior, (b) posterior claw of one front tarsus of ♂.

Fig. 29.—*Allochares azureus* (Cresson). A tarsal claw of ♀.

Fig. 30.—*Cosmiaporus diverticulus* (Fox). A tarsal claw of ♀.

Fig. 31.—*Psorthaspis planata* (Fox). Antenna of ♂.

Fig. 32.—*Pedinaspis operculatus* (Klug). Genital capsule of ♂, dorsal aspect of right half and the aedeagus, basal ring omitted. Broken line on the paramere indicates the edge of a hyaline area.

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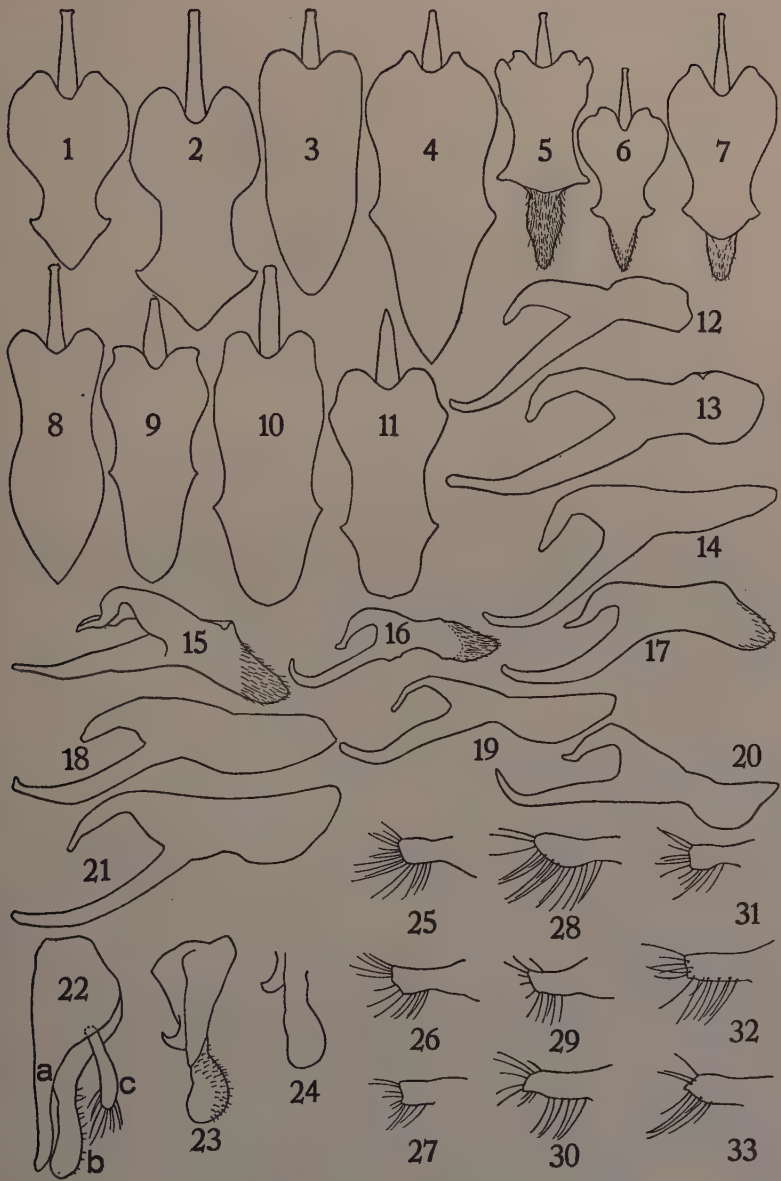
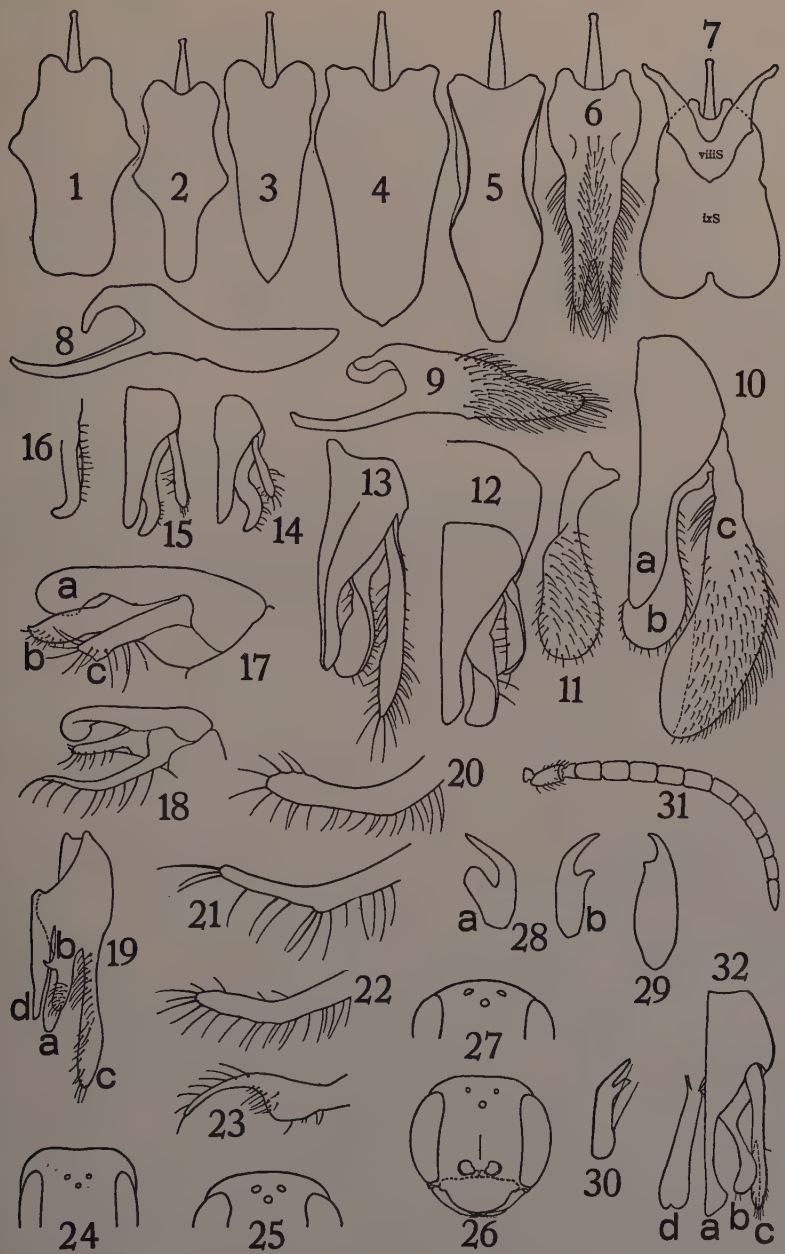


BRADLEY—AMERICAN POMPILINAE



BRADLEY—AMERICAN POMPILINAE

SYNOPSES OF NORTH AMERICAN EPHYDRIDAE (DIPTERA)

PARTS IA AND II[1]

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The purpose of these synopses is given in part I, so it is unnecessary to again state it here, except to say that part I treats of the species of the subfamily Psilopinae. The present paper contains two parts, of which the first is a supplement of part I giving some corrections and additions which are deemed necessary to make at this time; the second part treats of three tribes of the subfamily Notiphilinae.

Part Ia. Supplement to Part I on the Subfamily Psilopinae.

In the first part of these synopses, on the Psilopinae, of which this is a supplement, I neglected to give some important synonymy, some of which are made necessary after the study of additional material. Also some errors were made, typographical and others, which I consider of sufficient importance to correct in this supplement in order that the first number of these synopses may better serve its purpose. The page numbers given within parentheses ( ) refer to pages of part I above mentioned.

Key to the genera.—In the key to the genera of the Psilopinae, the second section of caption 23 on page 105, should refere to 24 instead of 25.

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[1] Part I appeared in these Transactions, LXVIII, pp. 101–128, 1942.

ATHYROGLOSSA Loew (Page 106.)

1860. *Athyroglossa* Loew, Neue Beitr., VII, p. 12.
1896. *Ochtheroidea* Williston, Trans. Ent. Soc. London, 1896, p. 401.

I find no structural features of generic importance by which *Ochtheroidea* should be considered distinct.

Athyroglossa granulosa (Cresson) (Page 106.)

1922. *Ochtheroidea granulosa* Cresson, Trans. Amer. Ent. Soc., LVII, p. 341.

This species was inadvertently omitted, although included in the key.

A comparatively scarce species occurring east of the Rocky Mountains and also in California.

Pelignus salinus Cresson (Page 109.)

1926. *Pelignus durrenbergensis* Cresson in part (not Loew), Trans. Amer. Ent. Soc., LII, p. 254.
1942. *Pelignue salinus* Cresson, Trans. Amer. Ent. Soc., LXVIII, p. 109.

The misidentification of *durrenbergensis* should be given here.

Athyroglossa melanderi (Cresson) (Page 106.)

1922. *Ochtheroidea melanderi* Cresson, Trans. Amer. Ent. Soc., XLVII, p. 399.

In part I the note under this species should read: A rare species known only by the type series from Stanford University, California.

Hydrochasma: Key to the species . . . (Page 113.)

The bottom line in the key should refer to *leucoprocta,* not *leucostoma.*

Discocerina (Discocerina) obscurella (Fallen) (Page 115.)

1813. *Notiphila obscurella* Fallen, Handl., K. Svenska. Vet.-Akad., XXXIV, p. 25.
1862. *Discocerina parva* Loew, Monogr. Dipt. N. Am., I, p. 146.

The synonymy of *parva,* I had previously given,[2] but it should be repeated in these Synopses.

Diclasiopa lacteipennis (Loew) (Page 117.)

1862. *Discocerina lacteipennis* Loew, Monogr. Dipt. N. Am., I, p. 145.
1869. *Hecamede xanthocera* Loew, Berich. Naturw. Var. Augsburg, XX, p. 58.

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[2] Trans. Amer. Ent. Soc., LI, p. 254, 1925.

The European *xanthocera* I have already synonymized,[3] but that fact should be shown here.

Ditrichophora (Gymnoclasiopa) argyrostoma (Cresson) (Page 121.)

1916. *Discocerina argyrostoma* Cresson, Entom. News, XXVII, p. 149.
1922. *Discocerina aliena* Cresson, Entom. News, XXIII, p. 137.

The reference to *aliena* is added as this species was inadvertently described under the two names.

Psilopa olga Cresson (Page 124.)

1922. *Psilopa olga* Cresson, Entom. News, XXXIII, p. 137.
1922. *Psilopa dimidiata* Cresson, Entom. News, XXXIII, p. 137.
1925. *Clasiopella dimidiata* Cresson, Trans. Amer. Ent. Soc. LI, p. 248.
1925. *Clasiopella girschneri* Cresson in part (not Von Roeder), Trans. Amer. Ent. Soc., LI, p. 249.

These additional synonymys are pertinent, but it is possible that further study of more material may show *dimidiata* to be distinct from *olga*.

Psilopa pulchripes Loew (Page 124.)

1878. *Psilopa pulchripes* Loew, Zeit. f. Gesam. Wissens., Berlin, LI, p. 197.
1926. *Psilopa unica* Cresson, Trans. Amer. Ent. Soc., LII, p. 250.

The synonymy of *unica* should have been cited as it was found to be such after studying the type of *pulchripes* in the Museum of Comparative Zoology Collection. *Pulchripes* is a Neotropical species of which *dupla* Cresson is the more northern representative.

Psilopa flavida Coquillett (Page 124.)

1900. *Psilopa flavida* Coquillett, Can. Entom., XXXII, p. 33.
1942. *Psilopa flava* Cresson, Trans. Amer. Ent. Soc., LXVIII, p. 125. (Error for *flavida*.)

This species was inadvertently cited as *flava*.

Leptopsilopa nigrimana (Williston) (Page 126.)

1896. *Psilopa nigrimana* Williston, Trans. Ent. Soc. London, 1896, p. 393.
1918. *Psilopa willistoni* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 53.

The name *willistoni* was given this species because of a previous use of *nigrimana* by von Roeser in the genus *Ephygrobia,* which latter is synonymous with *Psilopa*. Von Roeser's species is considered a synonym of *Psilopa nitidula* (Fallen), but the actual

[3] Entom. News, XXXV, p. 160, 1924.

combination with *Psilopa* has apparently never been made. Now as Williston's species is removed to *Leptopsilopa,* his name *nigrimana,* can be resurrected.

Leptopsilopa varipes (Coquillett) (Page 126.)

1900. *Psilopa varipes* Coquillett, Can. Entom., xxx, p. 33.
1941. *Helaeomyia californica* Cresson, Entom. News, LII, p. 35.

Study of additional material proved *californica* to be synonymous with *varipes.* The type specimen of *californica* from Davis, California, was received from Mr. Geo. Steyskal and not from Dr. Melander, as erroneously stated.

PLAGIOPSIS Cresson (Page 126.)

1918. *Plagiops* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 53. (Not Townsend, 1911.)
1936. *Plagiopsis* Cresson, Trans. Amer. Ent. Soc., LX, p. 201.

The previous use of *Plagiops* by Townsend in 1911, made necessary the change to *Plagiopsis.*

Plagiopsis hinei (Cresson) (Page 127.)

1922. *Plagiops hinei* Cresson, Entom. News, XXXIII, p. 135.

The above is the correct original reference to this species. The 1922 reference given as *Psilopa hinei* in part I, is a lapsus calami as can be easily ascertained.

Ceropsilopa adjuncta Cresson (Page 128.)

1925. *Ceropsilopa adjuncta* Cresson, Entom. News, XXXVI, p. 165.
1942. *Ceropsilopa adjunta* Cresson, Trans. Amer. Ent. Soc., LXVIII, p. 128. (Error for *adjuncta.*)

The name *adjunta* as cited in part I is a lapsus calani.

Calnoneurum americanum Cresson (Page 128.)

1924. *Clanonurum cimiciformis* Cresson (not Haliday), Entom. News, XXXV, p. 163.
1940. *Clanoneurum americana* Cresson, Notulae Nat., no. 38, p. 1.

This species had first been recorded from North America as *cimiciformis* Haliday, but the American form has since been considered distinct.

Part II. The Tribes Hydrelliini, Hydrinini and Ilytheini of the Subfamily Notiphilinae, with Descriptions of New Species

This part contains the interesting, but difficult genus *Hydrellia* constituting the tribe Hydreliini which is closely associated with the tribes Hydrinini and Ilytheini; the latter containing species with maculate wings, a feature not common in the Notiphilinae.

The types of the new species, except as otherwise mentioned, have been presented to the Academy's collection by Dr. A. L. Melander.

Tribe HYDRELLIINI new tribe

This tribe contains at present, but one genus which is easily recognized by the general Notiphiline features, but the species average smaller, some scarcely more than one and a half millimeters in length; the ocellars are rarely stronger than the postocellars and are sometimes scarcely discernible; the eyes are pilose and the second antennal segment is with or without minute spine; the humeral and supra-alar are usually weak and the posterior notopleural is not removed dorsad from the margin; the costa extends to the fourth vein. The face is generally evenly convex but in a few species is prominent and somewhat carinate, without any median tuberosity; the facials are relatively fine, hair-like and noncruciate; arista with long hairs; there are always one to three dorsocentrals present.

HYDRELLIA Robineau-Desvoidy

1830. Essai Myod., p. 790.

This genus is one of the most difficult of the Ephydridae and a more satisfactory classification of its species will probably not be secured until a thorough study of the genitalia is made, as these organs show a great variety of forms.

1. **Hydrellia formosa** Loew

1861. *Hydrellia formosa* Loew, Berl. Ent. Zeit., v, p. 355; (Cent., I, no. 98).

An eastern species ranging westward to Missouri and southward into the Neotropical. Hardly a common species.

2. **Hydrellia americana** Cresson

1931. *Hydrellia americana* Cresson, Entom. News, XLII, p. 106.

A rare species from Maine, New York and Maryland, of which only the female sex is known.

3. **Hydrellia prudens** Curran

1930. *Hydrellia prudens* Curran, Bull. Amer. Mus. Nat. Hist., LXI, p. 78.
1940. *Hydrellia johnsoni* Cresson, Entom. News, LII, p. 37.

A scarce boreal species from eastern Canada, Maine and Idaho.

4. **Hydrellia tibialis** Cresson

1917. *Hydrellia tibialis* Cresson, Entom. News, XXVIII, p. 341.

Rather a common species ranging over all the United States except the arid southwest.

5. **Hydrellia borealis** new species

Certainly belongs to the *tibialis* assemblage, but the general color of the vestiture is light, rather olivaceous than blackish.

Entirely black except halteres and bases of tarsi. Antennae slightly diluted. Head and thorax almost opaque, olivaceous to brownish gray; mesonotum and pleura concolorous; face yellowish, sericeous. Abdomen more shining, almost without vestiture.

Head rather narrow, width to height as 50 : 40; reclinate frontal moderately strong. Face narrow, nearly one-third width of head, about as 15 : 50, length to breadth as 24 : 14; parafacies linear above, scarcely dilated at cheeks. Cheeks about .5 as broad as antenna III. Arista with seven to eight hairs.

Tergite V of male not noticeably enlarged. Hind tibiae noticeably dilated medianly. Costa III nearly as long as II.

Length, 2 to 2.3 mm.

Type.—Male; Mer Bleue, Ottawa, Canada; July 2, 1938; (A. L. Melander); [A.N.S.P., no. 6653].

Paratypes.—1 ♀; Silver Creek, Ontario, Canada; July 14, 1923; (C. H. Curran); [Canada Nat. Colln.]. 1 ♀; Dolly Copp, Mt. Washington, New Hampshire; July 4, 1936; (A. L. Melander); [Melander Colln.].

6. **Hydrellia nobilis** (Loew) new combination

1862. *Rsilopa nobilis* Loew, Berl. Ent. Zeit., VI, p. 229; (Cent., II, no. 92).

A scarce eastern species.

7. **Hydrellia serena** Cresson

1931. *Hydrellia serena* Cresson, Entom. News, XLII, p. 104.

Not an uncommon northern species.

8. **Hydrellia advena** Cresson

1934. *Hydrellia advena* Cresson, Entom. News, XLV, p. 236.

A scarce species, known only from Mr. Desert Island, Maine.

9. **Hydrellia procilnata** Cresson

1915. *Hydrellia proclinata* Cresson, Entom. News, XXVI, p. 69.

A fairly common species of the West Coast States, but ranging eastward into Utah and New Mexico.

10. **Hydrellia lata** new species

Although not typically a member of the *proclinata* assemblage, it is apparently closely allied. It differs from the other members in the proportionately broad head. Only the female sex is known.

Black, almost shining, species with yellow palpi; tarsi brown to black. Halteres lemon yellow; wings with dark veins.

Face and ventral regions of thorax, cinerous. Frons almost uniformly opaque black; dorsal surfaces of thorax and abdomen almost shining, somewhat obscured by brown pollen. Mesopleura dorsad, and metanotum, dark.

Structurally similar to *serena* except in the broad head which is nearly one-half again as broad as high (as 37 : 20); frons and face correspondingly broader and shorter, the latter about as 7 : 10 respectively, the facial orbits thus much more flaring and the shorter face allows the decumbent antennae to about attain upper facial. In other respects the species seems identical with *serena*.

Type.—Female; "Nasel R"[iver, Pacific County], Washington; July 15, 1922; (A. L. Melander); [A.N.S.P., no. 6655].

Paratypes.—2 ♀; with same data as for type.

11. **Hydrellia ischiaca** Loew

1862. *Hydrellia ischiaca* Loew, Monogr. N. Amer. Dipt., I, p. 150.

An uncommon species, from the northern parts of the country.

12. **Hydrellia definita** new species

Similar to *H. ischiaca* Loew, but the legs are entirely black. The position of this species is difficult to determine, but the genitalic development suggests relationship with *griseola*.

Palpi yellow; halteres pale yellow; the pale flexor pile on the tarsi, in the female sex, gives like color to their segments. Wings with dark veins.

Subopaque to shining on dorsal surfaces, becoming dull cinereous on the face, pleura (except metanotum), venter of abdomen, and legs. Cinereous ares of mesopleura sharply limited at dorsal margin. Frons, mesonotum and scutellum, with sparse, somewhat cinereous dusting; humeri and notopleura, dark, concolorous with mesonotum. Any vestiture on abdominal dorsum is brown. Frontalia scarcely differentiated in any aspect.

Head slightly broader than high (as 50 : 40); frons to width of head as 25 : 50, almost quadrate; anterior ocellars almost as strong as posterior pair; frontorbital as strong as frontal. Face to width of head as 15 : 50, and length to width as 20 : 15; orbits rather well flaring to narrow cheeks which are as broad as width of antenna III; foveae distinct but shallow; carina rounded; two of the three strong facials are dorsad of line of buccal orbit. Antennae of male missing; arista of female with six hairs.

Mesonotal setulae rather strong; presutural dorsocentral just discernible, very close to postsutural, which later is well in advance of line of intra-alar setulae. Tergite V of male broader than long, rather broadly rounded apicad. Wings long, with costa II and III as 75 : 54.

Length, 2.4 mm.

Type.—Male; Spanish Fork, Utah; (D. E. Hardy); [A.N.S.P., no. 6654].

Paratype.—1 ♀; Hot Springs, Fall River Co., South Dakota; July 13, 1924; (H. C. Severin); [A.N.S.P].[4]

13. **Hydrellia griseola** (Fallen)

1813. *Notiphila griseola* Fallen, K. Svenska Vet. Akad. Handl., XXXIV, p. 250.

1835. *Hydrellia griseola* Macquart, Hist. Nat. Ins., Dipt., II, p. 523.

The most abundant species of the genus and subject to great variation, particularly in the color of the face. It is apparently Holarctic in distribution, and the American forms have been described, and may be known, under the following names:

13a. **Hydrellia griseola var. hypoleuca** Loew

1862. *Hydrellia hypoleuca* Loew, Monogr. Dipt. N. Amer., I, p. 151.

This is a common variety in which the face is white, but it intergrades perfectly with the following.

13b. **Hydrellia griseola var. scapularis** Loew

1862. *Hydrellia scapularis* Loew, Monogr. Dipt. N. Amer., I, p. 153.

[4] This paratype is placed in the Academy's Collection by Dr. H. C. Severin of the South Dakota State College.

Another common variety in which the face is yellow to golden but which sometimes cannot be separated from the preceding or the following.

13c. **Hydrellia griseola** var. **obscuriceps** Loew

1862. *Hydrellia obscuriceps* Loew, Monogr. Dipt. N. Amer., I, p. 152.

A rare to scarce variety in which the face is velvety black to brown, but sometimes cannot be separated from the darker forms of the preceding *scapularis*.

14. **Hydrellia valida** Loew

1862. *Hydrellia valida* Loew, Monogr. Dipt. N. Amer., I, p. 153.

A relatively large, northeastern species; and rather scarce.

15. **Hydrellia flavicoxalis** new species

Evidently related to *griseola* and simular to the European *modesta* Loew, in the genitalic development and other respects, but quite distinct in its pale fore coxae which is very marked in ventral aspect.

Pale, yellow: palpi, fore coxae, flexor pubescence of mid and hind tarsi. Halteres white. Otherwise black.

Face and lunule sericeous, golden to yellow in the male, paler, almost white in female. Mesofrons, mesonotum including notopleura, and scutellum, light brown; frontalia black. Antenna III, occiput, humeri somewhat, mesopleura except dorsocaudal angle, ventral lobes of abdomen, femora and tibiae, cinereous. The ochraceous or light brown vestiture of the mesonotum, including the notopleura and to some extent the humeri, slightly encroaches onto the mesopleura. Abdominal dorsum somewhat shining, sparsely ochraceous, cinereous laterally and apically.

Head slightly broader than high; frons transverse, with very weak ocellars and strong frontorbital. Face about .2 width of head, distinctly longer than broad, flat to weakly convex; orbits strongly flaring ventrad; facial series of four to five fine bristles is very close to the linear parafacies. Cheeks as broad as width of antenna III. Mesonotum rather strongly setose with strong antesutural dorsocentral far removed cephalad, but forming with the postsutural a transverse rectangle. Tergite V of male broadly rounded apically; genital segment broad, as in *griseola*.

Length, 2 mm.

Type.—Male; Walden, Jackson County, Colorado; July 27, 1938; (M. T. James); [A.N.S.P., no. 6666].[5]

Paratype.—1 ♀; topotypical.

[5] Type retained by the Academy by permission of the Colorado State College of Agricultural and Mechanical Arts, through Mr. Maurice T. James.

16. **Hydrellia wilburi** new species

Very similar to *H. platygastra* Cresson, but the face is niveous, the lateral areas including the frontalia and parafacies are more or less velvety black. The genitalic assemblage of the male is also similar to that of *platygastra*.

Pale, yellowish: tarsi except apices and halteres. Antennae and palpi black. Wing veins black.

Shining to semishining; the sparse brownish polliniferous vestiture not obscuring the shining surfaces except on the frons which is entirely opaque, the mesofrons, however, is differentiated from the frontalia by sparse brownish vestiture. Lunule and face niveous, sericeous, but the latter is laterally black, which color appears to reduce the width of the face when seen in lateral aspect. Cheeks mostly black.

Structurally similar to *platygastra* but abdomen of male is less laterally compressed.

Length, 2.4 mm.

Type.—Male; "Bear Lake," Routt County, Colorado; 8500 feet alt.; August 19, 1935; (D. A. Wilbur); [A.N.S.P., no. 6657].[6]

Paratypes.—1 ♂, 1 ♀; with same data as for type.

17. **Hydrellia platygastra** Cresson

1931. *Hydrellia platygastra* Cresson, Entom. News, XLII, p. 106.

A scarce West Coast species.

18. **Hydrellia morrisoni** Cresson

1924. *Hydrellia morrisoni* Cresson, Entom. News, XXXV, p. 162.

A rare northeastern species from New Hampshire and New York.

19. **Hydrellia penicilli** new species

Very similar to *morrisoni* Cresson.

Pale, yellow to orange: ground color of face except parafacies, palpi, antennae II somewhat, and base of hind tarsi. Halteres lemon yellow. Wings veins rather pale.

Entirely yellow to grayish pollinose, becoming cinereous on pleura, metanotum and legs. Face sericeous, yellow to whitish. Frons in cephalic aspect, uniformly dusted, the darker parafrons, in dorsal aspect, somewhat dusted. Abdomen, in caudal aspect, blackish medianly on dorsum.

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[6] The type of this species is presented to the Academy by Mr. Curtis W. Sabrosky.

Structurally similar to *morrisoni* but larger. Face more prominent submedianly. Cheeks about as broad as antennae III. Mesonotal setulae stronger, the antesutural dorsocentral more in evidence, often one-half as long as postsutural one. Tergite V of male not compressed. Mid tibiae of male slightly thickened and hind tibiae similar to those of *morrisoni,* sometimes appearing slightly bowed; hind metatarsus at base with oblique anteroflexor comb of three to four black setulae.

Length, 2.4 to 3.3 mm.

Type.—Male; Pembroke, Ontario, Canada; July 3, 1938; (A. L. Melander); [A.N.S.P. no. 6656].

Paratypes.—4 ♀; with same data as for type.

20. **Hydrellia subnitens** Cresson

1931. *Hydrellia subnitens* Cresson, Entom. News, XLII, p. 106.

A scarce western species from Washington and Oregon. The females of this and the three following species are difficult or impossible to separate.

21. **Hydrellia crassipes** Cresson

1931. *Hydrellia crassipes* Cresson, Entom. News, XLII, p. 107.

A relatively common species from Ohio.

22. **Hydrellia procteri** Cresson

1934. *Hydrellia proctori* (!) Cresson, Entom. News, XLV, p. 235.

A rare northeastern species from Maine and New Jersey.

23. **Hydrellia suspecta** Cresson

1936. *Hydrellia suspecta* Cresson, Trans. Amer. Ent. Soc., LXII, p. 258.

A very rare species, known only by the male type and female paratype from Mt. Desert Island, Maine.

24. **Hydrellia atroglauca** Coquillett

1910. *Hydrellia atroglauca* Coquillett, Proc. Ent. Soc. Wash., XII, p. 131.

A rare species from Florida.

25. **Hydrellia cruralis** Coquillett

1910. *Hydrellia cruralis* Coquillett, Proc. Ent. Soc. Wash., XII, p. 131.

A relatively common northern species and which has been bred from pondweed in Michigan.

26. **Hydrellia** bergi Cresson

1941. *Hydrellia bergi* Cresson, Entom. News, LII, p. 37.

Not a common species and known only from Michigan, where it has been bred from pondweed.

27. **Hydrellia caliginosa** Cresson

1936. *Hydrellia caliginosa* Cresson, Trans. Amer. Ent. Soc., LXII, p. 257.

A rare species from Maine and Michigan. It is associated with spatter dock and pondweed.

28. **Hydrellia notiphiloides** Cresson

1924. *Hydrellia notiphiloides* Cresson, Entom. News, XXXV, p. 162.

A rare species, known only from Massachusetts and Ohio.

29. **Hydrellia luctuosa** Cresson

1924. *Hydrellia luctuosa* Cresson, Entom. News, LIII, p. 78.

A rare species from Michigan, reared from pondweed.

30. **Hydrellia decens** Cresson

1931. *Hydrellia decens* Cresson, Entom. News, XLII, p. 107.

Known only by the type series from Maryland.

31. **Hydrellia pulla** Cresson

1931. *Hydrellia pulla,* Cresson, Entom. News, XLII, p. 108.

A scarce northern species, associated with pondweed.

32. **Hydrellia trichaeta** Cresson

1944. *Hydrellia trichaeta* Cresson, Notulae Nat., no. 135, p.

A rare species, known to me from Massachusetts, Rhode Island, Connecticut and Illinois.

33. **Hydrellia bilobifera** Cresson

1936. *Hydrellia bilobifera* Cresson, Trans. Amer. Ent. Soc., LXII, p. 262.

Known only from Missouri. Rare.

34. **Hydrellia ascita** Cresson

1942. *Hydrellia ascita* Cresson, Entom. News, LIII, p. 78.

Bred from pondweed in Michigan. Rare.

35. **Hydrellia harti** Cresson

1936. *Hydrellia harti* Cresson, Trans. Amer. Ent. Soc., LXII, p. 262.

Known only from Illinois. Rare.

Key to the Nearctic Species of the Genus Hydrellia

1. Frons uniformly velvety-black; the lunule contrastingly niveous to yellowish 12
   Frons, if uniformly opaque black, is not velvety.....2
2. Face flattened on the expansive lower part, strongly retreating in profile, the broad facialia extending well into the cheek area....36
   Face not so developed.....3
3. Palpi yellow.....17
   Palpi black or definitely dark 4
4. Reclinate frontal absent 6
   Reclinate frontal present and strong.....5
5. Mesopleura concolorous with mesonotum, either cinereous or dark.7
   Mesopleura, in dorsal aspect, lighter than mesonotum, generally cinereous. Antesutural dorsocentral weak or undeveloped; frons rather quadrate, with anteocellar distance more than three times diameter of anterior ocellus; face dull, ochraceous to cinereous with four facials. Shining species, but not metallic colored; entirely black except palpi; abdomen not cinereous laterad; costa II longer than III.....12. **definita** Cresson
6. Dorsocentrals approximate; mesonotum subopaque not metallic colored! upper part of mesopleura dark; tarsi black; arista with 6 to 8 hairs.....9. **proclinata** Cresson
   Dorsocentrals well separated; mesonotum shining metallic colored; mesopleura entirely cinereous, tarsi pale; arista with 9 to 11 hairs. 30. **decens** Cresson
7. Mesonotum and mesopleura cinereous or olivaceous.....9
   Mesonotum and mesopleura dark. Hind tibia thickened, slightly arcuate 8
8. Face and cheeks broad, the latter about equalling length of antenna III; arista with 8 to 9 hairs. Genital segment of male large, with large anal valve.....18. **morrisoni** Cresson
   Face narrow, about twice as long as broad, its orbits but slightly flaring ventrad; cheeks narrow; arista with 6 to 7 hairs. 5. **borealis** Cresson
9. Antesutural dorsocentral weak or absent, not as strong as postsutural 15
   Antesutural dorsocentral well developed, as strong as postsutural.10
10. Species entirely black except halteres knob, opaque, without any trace of cinereous vestiture; small species....29. **luctuosa** Cresson
    Species with pale tarsi. Genital segment laterally compressed, with large anal valve.....11

11. Face opaque, black or brown (may be golden in lateral aspect or rarely niveous in extreme dorsal aspect). Apex of abdomen of male noticeably laterally compressed; genital segment of male large with large anal valves. Large dark species with pale palpi; pleura and metanotum cinereous; strong proclinate frontorbitals. 17. **platygastra** Cresson

    Face in both sexes niveous in lateral and dorsal aspects, with black orbits.....16. **wilburi** Cresson

12. Palpi and generally antennae and tarsi yellow. Frons, notopleura and scutellum velvety black. Small species (1 to 1.5 mm.) with pale wing veins.....1. **formosa** Loew

    Palpi black; notopleura and scutellum not velvety-black.....13

13. Antesutural dorsocentral well developed, strong; tarsi pale. Large species (2.4 mm.); male with large anal valve; mid tibia not thickened; face niveous in dorsal aspect with black orbits; mesonotum, scutellum and abdomen, somewhat shining....16. **wilburi** Cresson

    Antesutural dorsocentral minute or absent; legs entirely black. Small species (1.2 to 2 mm.).....14

14. Lunule conspicuous, niveous; abdomen shining; wings clear; frons opaque velvety black.....2. **americana** Cresson

    Lunule not conspicuous; entirely opaque species with frons opaque black, some appearing velvety; wings somewhat brownish. 3. **prudens** Curran

15. At least mid and hind tarsi pale; species generally olivaceous. 5. **borealis** Cresson

    Legs entirely black; dark species.....16

16. Entirely opaque species; frons uniformly opaque black, sometimes almost velvety; mesofrons not differentiated..3. **prudens** Curran

    Somewhat shining species; frontalia and mesofrons differentiated. 4. **tibialis** Cresson

17. All tibia black, or at most their extremities pale.....21

    At least the fore tibia entirely pale.....18

18. Antesutural dorsocentral weak or absent, but always, if present, approximate to postsutural.....20

    Antesutural dorsocentral strong and well separated from the postsutural 19

19. Arista with about 5 hairs; frons quadrate. Mostly opaque cinerous species; face rather flattened, sericeous, white to yellow; facials strong, close to parafacies; mid and hind tibiae rarely infuscated medianly; fore coxa and generally the tarsi are dark; thorax entirely cinereous; abdomen narrow; costa II not distinctly longer than III.....25. **cruralis** Coquillett

    Arista with 8 to 10 hairs; frons transverse. Cheeks narrow; abdomen broad, ovate, dark medianly; tergites with cinereous lateral apical angles; costa II distinctly longer than III. 24. **atroglauca** Coquillett

20. Humeri and notopleura concolorous with the dark mesonotum; mesopleura cinereous; large species (3 mm.) with antenna II generally pale; fore coxa dark; abdomen narrow, with tergite V of male acute apicad.....6. **nobilis** Loew
    Humeri and notopleura cinereous concolorous with the mesopleura; small species with fore coxa and all tarsi pale; abdomen rather broad with tergire V of male broad apicad.....11. **ischiaca** Loew
21. Mesonotum darker than mesopleura, olivaceous, ochraceous or blackish 23
    Mesonotum and mesopleura uniformly cinereous.....22
22. Vestiture uniformly whitish to cinereous, not olivaceous and nowhere darker on dorsal surfaces. Ocellars weak; face rather sericeous, yellowish, with at least three hair-like facials above line of buccal orbits; no black flexor setulae at base of hind metatarsus; abdomen of male broadly truncate.....14. **valida** Loew
    Vestiture rather olivaceous, that on postscutum and basad on abdomen, generally darker, sometimes the mesonotum except humeri, dark. Face sericeous, with at least three fine facials above line of buccal orbit; mesonotal setulae not noticeably strong; antesutural dorsocentral sometimes strong; abdomen broad apicad; flexor pubescence of hind metatarsus uniformly pale, without any black setulae at base.....13. **griseola** (Fallen)
    Vestiture uniformly olivaceous but dark on dorsum of abdomen medianly in certain aspects. Ocellars strong; scarcely more than two strong facials above line of buccal orbit; mesonotal setulae rather strong; hind metatarsus with three to four black flexor setulae at base.....19. **penicilli** Cresson
23. Antesutural dorsocentral strong and well separated from postsutural, at least for a distance equal to that between dorsocentral series.29
    Antesutural dorsocentral, if well developed, is approximate to postsutural, at least nearer than distance between the series.....24
24. Mesonotum blackish to olivaceous, at least humeri, notopleura and pleura, cinereous; antesutural dorsocentral generally much reduced or not different from preceding setae; apex of male abdomen broad.....13. **griseola** (Fallen)
    Mesonotum opaque, light brown, including notopleura and sometimes humeri; mesopleura cinereous; mesonotal setae strong, the antesutural dorsocentral well developed; face sericeous, golden-yellow in the males.....15. **flavicoxalis** Cresson
    Mesonotum blackish, with sparse vesiture, including that on humeri and notopleura.....25
25. Mesopleura for the most part, dark.....27
    Mesopleura entirely cinereous or at most brownish dorsad.....26

26. Antennae and fore tarsi entirely black. Antesutural dorsocentral weak; abdomen of male narrow apicad.....12. **definita** Cresson
Antenna III of male mostly, and fore tarsi of both sexes entirely, pale. Mesonotum, scutellum, humeri and metanotum, dark; antesutural dorsocentral strong; abdomen broadly ovate with narrow genital segment; femora not noticeably thickened.
23. **suspecta** Cresson
27. Abdomen opaque, black, with very little cinereous overcast, at most slightly shining. Antesutural dorsocentral strong; costa II about equal to III; small species (1.5 to 2 mm.).....8. **advena** Cresson
Abdomen shining, or but slightly overcast.....28
28. Face broad, nearly three times width of head, almost as broad as long; mouth large. Mesopleura dark, not contrasting with mesonotum; antesutural dorsocentral weak, but surrounding setulae strong; rather shining species with sparse vestiture on dorsal surfaces.....10. **lata** Cresson
Face narrow, about one quarter width of head, much longer than broad; mouth small. Frons distinctly transverse, with anteocellar distance short, about three times diameter of anterior ocellus; antesutural dorsocentral weak sometimes not discernible; abdomen of male narrow; entirely black species except palpi, at most with pleura somewhat cinereous ventrad.....7. **serena** Cresson
29. Arista with 8 to 10 hairs; tibiae for the most part, and tarsi entirely, pale. Frons transverse; cheeks narrow; mesonotum including humeri and notopleura, dark; mesopleura cinereous; abdomen broad, dark medianly, cinereous laterally and apically.
24. **atroglauca** Coquillett
Arista with 6 to 8 hairs; tibiae black, at most with extremities pale.....30
30. Tarsi black or brown, not contrasting with tibiae.....33
Tarsi pale, strongly contrasting with tibiae.....31
31. Antenna III black; hind legs noticeably robust.....32
Antenna III pale; hind legs slender, their tibiae pale at extremities. Setation comparatively weak; moderately dark species including humeri, but mesopleura mostly cinereous...20. **subnitens** Cresson
32. Flexor foliation of hind tibiae narrow, distad; abdomen dorsum at most showing only slight cinereous vestiture and then only at lateral apical angles of some tergites; protegen apex only slightly incised.....22. **procteri** Cresson
Flexor foliation of hind tibiae broad, proximad; abdomen generally broadly cinereous laterally; protegen apex deeply incised.
21. **crassipes** Cresson
33. Facialia broad with a series of stout facials which are removed from parafacies, and usually some setulae present in a secondary series. Dark species with cinereous pleura contrasting with mesonotum; costa II longer than III.....35

Facialia narrow with the facial series of fine setae close to parafacies; no secondary series of facials.....34

34. Face not particularly sericeous; ocellars almost as long as postocellars; genitalia of male not conspicuous; protegen of male genitalia not noticeable. Median size, entirely black species, including tibiae and tarsi; frons rather evenly opaque black; face with short facials; arista with 6 to 8 hairs.....27. **caliginosa** Cresson

Face sericeous, golden; ocellars much longer than postocellars; genitalia of male conspicuous with large pale protegen. Costa II at most slightly longer than III.....26. **bergi** Cresson

35. Face conically prominent in profile with sharp carina. Large dark species except the orange palpi; one facial above line of buccal orbit; costa II much longer than III.....31. **pulla** Cresson

Face not noticeably prominent in profile, not sharply carinate. Small (2 mm.) species, dark including tibiae and tarsi with cinereous pleura strongly contrasting with mesonotum; parafacies well dilated ventrad.....28. **notiphiloides** Cresson

36. Tibiae and fore tarsi totally black; mesonotum including humeri and notopleura distinctly darker than the pleura....34. **ascita** Cresson

Tibiae mostly, and tarsi except, at most, apices, pale; mesonotum not or but slightly darker than pleura.....37

37. Setae of tarsi long, suberect, equalling or exceeding their diameters; a second postsutural dorsocentral usually present and well developed.....35. **harti** Cresson

Setae of tarsi normal, subappressed, not noticeably long; a second postsutural dorsocentral present and well developed. 32. **trichaeta** Cresson

Setae of tarsi normal; no second postsutural dorsocentral present, or it is represented only by a small seta.....33. **bilobifera** Cresson

Tribe Hydrinini new tribe

The species of this tribe of the Notiphilinae have the eyes pilose weak or undeveloped ocellars, face not nasute but usually the lower portion is the more prominent and the posterior notopleural distinctly removed dorsad. The tribe is quite distinct from the more closely related Hydrelliini and Ilytheini. From the former it is distinguished by the position of the posterior notopleural bristle and from the latter (Ilythenini) by the conformation of the face. The setation is more reduced or undeveloped than in the Hydrelliini.

Key to the North American Genera of the Tribe Hydrinini

Face relatively narrow, not concaved and if prominent, the epistoma is receding
  Arista bare; antesutural dorsocentral present. **Hydrina** Robineau-Desvoidy
  Arista short- to long-haired; antesutural dorsocentral absent. **Nostima** Coquillett
Face relatively broad, concaved, with prominent epistoma; arista long-haired.....**Lemnaphila** Cresson

LEMNAPHILA Cresson

1933. Cresson, Entom. News, XLIV, p. 229.

Lemnaphila scotlandae Cresson

1933. *Lemnaphila scotlandae* Cresson, Entom. News, XLIV, p. 229.

Known only from the type series reared from duck weed at Ithaca, New York. It has much the appearance of a small *Hydrellia.*

NOSTIMA Coquillett

1900. *Nostima* Coquillett, Can. Entom., XXXII, p. 35.
1917. *Philygriola* Hendel, Dept. Ent. Zeit., 1917, p. 42.

Hendel's *Philygriola* was erected for *Notiphila picta* Fallen, 1813, which is hardly generically distinct from *Nostima slossonae* Coquillett the genotype of *Nostima. Picta,* however, has certain characters which are here considered of subgeneric value.

Nostima (Philygriola) picta (Fallen)

1813. *Notiphila picta* Fallen, Handl. K. Svenska Vet.-Akad., XXXIV, p. 254.
1917. *Philygriola picta,* Hendel, Deut. Ent. Zeit., 1917, p. 42.

An European species known only in North America by a few specimens taken in the Northwestern States.

Nostima (Philygriola) scutellaris Cresson

1933. *Nostima scutellaris* Cresson, Entom. News, XLIV, p. 68.

Our more common relative of *picta* occurring east of the Rocky Mountains and in Arizona, but apparently not in the more southeastern portion of the United States.

Nostima (Philygriola) quinquenotata Cresson

1930. *Nostima quinquenotata* Cresson, Entom. News, XLI, p. 79.

A rare eastern, Austral, species, occurring from Maryland to Florida, westward to Michigan and Kansas.

Key to the North American Species of Nostima

Wings faintly infuscated, with five white or clear spots. **quinuenotata** Cresson
Wings immaculate
  Frons entirely velvety-black; legs entirely yellow. **scutellaris** Cresson
  Frons not velvety-black; legs with black femora.....**picta** (Fallen)

HYDRINA Robineau-Desvoidy

1830. *Hydrina* Robineau-Desvoidy, Essai Myod., p. 794.

Hydrina opposita (Loew)

1861. *Philygria opposita* Loew, Berl. Ent. Zeit., v, p. 538; (Cent., I, no. 95).

Not a common species, occurring in the Transition Zone of the northeastern and northwestern United States.

Hydrina nigrescens Cresson

1930. *Hydrina nigrescens* Cresson, Entom. News, XLI, p. 80.

A rare species known only from Utah and Idaho.

Hydrina debilis (Loew)

1861. *Philygria debilis* Loew, Berl. Ent. Zeit., v, p. 357; (Cent., I, no. 96).
1862. *Philygria fuscicornis* Loew, Monogr. Dipt. No. Amer., I, p. 155.
1902. *Hydrina debilis* Slosson, Entom. News, XIII, p. 8.

A very abundant species except in the Southeastern States.

The synonymy of *fuscicornis* is established by the examination of the types of both forms, at Cambridge.

Key to the North American Species of Hydrina

Wings with fuscous spots on the longitudinal veins....**opposita** (Loew)
Wings with fuscous spots only on the crossveins
  Vein long II long; costa II three to four times as long as III; only apical segment of abdomen (♂) shining.....**debilis** (Loew)
  Vein II shorter, costa II, not more than twice as long as III; abdomen almost entirely shining.....**nigrescens** Cresson

Tribe ILYTHEINI

1943. Cresson, Trans. Amer. Ent. Soc., LXIX, p. 1.

The species of this tribe are readily recognized by the nose-like facial profile and the rather uniformly spotted wings. The posterior notopleural is distinctly removed dorsad.

ILYTHEA Haliday

1839. An. Nat. Hist., III, p. 408.

Ilythea spilota (Curtis)

1832. *Ephydra spilota* Curtis, Brit. Entom., IX, p. and pl. 413.
1839. *Ilythea spilota* Haliday, An. Nat. Hist., III, p. 408.

A fairly common species distributed from Alaska to California and eastward to the Atlantic Coast, but apparently not found in the Gulf States.

Ilythea caniceps Cresson

1918. *Ilythea caniceps* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 50.

A Costa Rican species a form of which occurs in the western Coastal United States. Not common.

Ilythea flaviceps Cresson

1916. *Ilythea flaviceps* Cresson, Entom. News, XXVII, p. 147.

A rare species known only from Arizona.

ZEROS Cresson

1943. Trans. Amer. Ent. Soc., LXIX, p. 10.

Zeros vicinus Cresson

1943. *Zeros vicinus* Cresson, Trans. Amer. Ent. Soc., LXIX, p. 12.

Probably a Neotropical species but originally described and known only from Florida.

Zeros calverti (Cresson)

1918. *Ilythea calverti* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 51.
1943. *Zeros calverti* Cresson, Trans. Amer. Ent. Soc., LXIX, p. 11, pl. 1, fig. 4.

A Neotropical species occurring in Florida.

Zeros fenestralis (Cresson)

1918. *Ilythea fenestralis* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 51.
1943. *Zeros fenestralis* Cresson, Trans. Amer. Ent. Soc., LXIX, p. 12, pl. 1, fig. 6.

Another Neotropical species occurring in Florida.

Zeros obscurus (Cresson)

1918. *Ilythea obscura* Cresson, Trans. Amer. Ent. Soc., XLIV, p. 52.
1943. *Zeros obscurus* Cresson, Trans. Amer. Ent. Soc., LXIX, p. 14.

A Neotropical species ranging northward into New Mexico and Arizona.

Zeros flavipes (Williston)

1896. *Ilythea? flavipes* Williston, Trans. Ent. Soc. London, 1896, p. 403.
1943. *Zeros flavipes* Cresson, Trans. Amer. Ent. Soc., LXIX, p. 14, pl. 1, fig. 7.

A well distributed Neotropical species ranging northward into the Upper Austral as far as southern Michigan and southern Pennsylvania and west to the Rocky Mountains.

Key to the North American Genera and Species of Ilytheini

1. Vein II long, subparallel to the costa; costal section II more than twice as long as III **(Ilythea)**.....6
   Vein II short, mostly straight to costa, diverging from III; costa II not twice as long as III **(Zeros)**.....2
2. Abdomen polished black, without any trace of vestiture except at most on ventral lobes and at apex; wing maculation in form of intervenous fuscous bars, and with but one isolated bar in marginal beyond tip of vein II.....**Zeros flavipes** (Williston)
   Abdomen more or less distinctly pruinose, which sometimes almost totally obscures the shining surface.....3
3. Wing maculation consisting of relatively narrow fuscous intervenous bars, the hyaline interspaces but slightly suggesting rotundity in outline 5
   Wing maculation typically consisting of round hyaline intervenous spots in a fuscous field, the intervening fuscous areas rarely in form of parallel-sided bars.....4
4. Posterior crossvein wanting.....**Zeros vicinus** Cresson
   Posterior crossvein present.....**Zeros calverti** (Cresson)

5. Vein II straight to costa; maculation of wings sometimes almost obliterated but always bar-like; hyaline interspaces rectangular in shape; only faint metallic violet or blue reflections on frons and mesonotum.....**Zeros obscurus** (Cresson)

Vein II undulating and curving into costa; wing maculation strong, the hyaline interspaces sometimes rotund; strong metallic violet or blue reflections on frons and mesonotum.

Zeros fenestralis (Cresson)

6. Coxae and apices of tarsi and rest of legs, pale.

Ilythea Flaviceps Cresson

Coxae and femora black; at most two fuscous spots in distal half of submarginal 7

7. Tibiae paler than femora, yellow to ferruginous, at most infuscated medianly; vestiture of face usually more or less cinereous.

Ilythea caniceps Cresson

Tibiae black, at most narrowly pale apically; vestiture of face except foveae, brown.....**Ilythea spilota** (Curtis)

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A REVISION OF THE LOCUSTS OF THE GROUP HYALOPTERYGES

(ORTHOPTERA; ACRIDIDAE; ACRIDINAE)

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(Plates V and text-figures)

The very distinctive genera group Hyalopteryges [1] was established in 1893 by Brunner von Wattenwyl,[2] and then included *Achurum* Saussure, *Hyalopteryx* Charpentier and *Metaleptea* Brunner. In 1900 Lawrence Bruner added to these the genus *Eutryxalis,*[3] and in 1906 I gave as components of the group,[4] *Radinotatum* McNeill, *Achurum, Hyalopteryx, Eutryxalis, Truxalis* Fabricius (which equals *Metaleptea* as now understood) and *Orphula* Stål. The latter was the then current but erroneous interpretation of *Orphula,* the genus then examined being subsequently described by me as *Paratruxalis,* while the true *Orphula* is a member of another genera group. In 1922 Hebard [5] placed *Radinotatum* and *Achurum* in his new genera group Achuri, thus leaving within the Hyalopteryges the then described genera *Hyalopteryx* Charpentier, *Eutryxalis* Bruner, *Metaleptea* Brunner (as *Truxalis* of authors) and *Paratruxalis* Rehn.

Studies which I have recently made show that *Hyalopteryx* as currently understood is a clearly composite assemblage, including components of three well marked genera, two of which were undescribed. In addition the relationship of the Hyalopteryges to a paralleling New World genera group, for which the name Orphulae may properly be restricted, requires re-examination and full analysis. The results of the latter angle of this investigation I will present in a subsequent paper, the present one treating solely those genera which I place in the Hyalopteryges as now restricted.

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[1] Brunner spelled the group name Hyalopteriges.
[2] Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 118.
[3] Second Rep. Merchants' Loc. Invest. Comm. Buenos Aires, pp. 22, 24.
[4] Proc. Acad. Nat. Sci. Phila., 1906, p. 11.
[5] Trans. Amer. Entom. Soc., XLVIII, p. 89.

The Hyalopteryges are highly developed in austral South America, and comprise six genera, four of these not occurring north of south-central Brazil, while another (*Eutryxalis* as now understood) extends as far as northern South America. The sixth (*Metaleptea*) is of broad distribution, extending from central Argentina northward across northern South America, Central America, Mexico and the central and eastern United States to extreme southern Canada (Ontario). No member of the group, however, is known to occur west of the Andes south of Colombia, nor does *Metaleptea* extend west of the eastern edge of the Great Plains in North America. Similarly no member is definitely known from the West Indies.

It seems most probable that the generic differentiation of the group took place in the southern tropical and subtropical portions of South America, where all the genera now occur, and that the penetration of North America has been relatively recent, dating very probably from the re-establishment of the Panama land bridge in the Pliocene.

The most obvious feature of the Hyalopteryges is the often extreme development of the fenestration of the anterior field in the wings of the males. No other group of American acridines has this pane-like structure carried so generally to the point where the greatly expanded anterior field of the wing in that sex occupies as much of the total wing area. In addition the apex of the wing is definitely rectangulate to acute-angulate in both sexes, the tegminal distal extremity is also acute with the distal margin oblique truncate, and both apices are never rounded, while the fastigium is horizontally sublamellate produced into a definite rostration, in most of the genera quite markedly so; the antennae are ensiform to a variable degree, in most with this quite strongly marked; the male subgenital plate is conically, frequently spicately, produced, and the caudal femoral genicular lobes, and in some genera the dorso-genicular angles as well, are acute-produced, never rounded, and sometimes developed so markedly as to be lanceolate processes.

In the male sex of most of the genera of the Hyalopteryges the costal margin of the tegmina has, at the broadest point, a series

of minute spaced spicules. These are apparently lacking in *Paulacris* and almost obsolete in *Guaranacris,* numerous in *Hyalopteryx, Allotruxalis* and *Eutryxalis,* but very few and particularly small in *Metaleptea.* In the same relative area the costal margin of the wings is appreciably expanded, greatly thickened and usually sublamellately decurved ventro-cephalad, while the adjacent section of the discoidal vein is also distinctly thickened. In the genera which might be called the more typical hyalopterygoid ones, i.e. *Paulacris, Hyalopteryx* and *Guaranacris,* this development of the wing margin is much more decided than in the remaining members of the group. In these three genera the decurving margin partly encircles a longitudinal trough-like hollow, open ventrad, which like the more deplanate section immediately caudad of the discoidal vein is crossed and stiffened by a large number of very short and parallel cross-veins. We know nothing at present as to the function of these specializations, but presumably they are connected with the production of stridulation.

Certain members of the genera group Orphulae show definite convergence toward the Hyalopteryges, and these probably indicate the line along which this highly specialized group has developed from a more generalized stock, nearer akin to the Orphulae. In these genera of the Orphulae we find wing fenestration approximating that of the Hyalopteryges, but most of the genera placed in the former group can very readily be separated from those of the Hyalopteryges, and even those which suggest the latter can be properly assigned, by not having the full combination of features given above for the present assemblage.

The nearest Old World relatives of the hyalopterygine genera are the members of the group Odontomeli (Pargae of Ignacio Bolívar), an assemblage largely African in distribution. Hebard,[6] when erecting the group Achuri, stated that in his opinion the Odontomeli were the nearest Old World relatives of the Achuri. Apparently this is equally true for the Hyalopteryges, although the affinity of the Achuri and the Odontomeli seems somewhat closer than is that of the Hyalopteryges with the Old World group.

[6] Trans. Amer. Entom. Soc., XLVIII, p. 89, (1922).

It is significant that the less strongly specialized members of the Hyalopteryges are those of widest distribution, i.e. *Metaleptea* and *Eutryxalis,* and those of more limited range show the greatest extent of specialization. It is quite possible that the latter may have been inhibited from extending their range as readily as the others by a lack of adaptability due to their higher specialization. As none of these genera extend as far north as the Amazon Valley, nor occur in what might be called truly tropical lowland conditions, as do both *Metaleptea* and *Eutryxalis,* we can conceive as responsible only some control acting upon all four of these genera. While *Metaleptea* is definitely hygrophilous, and its distribution is influenced by these preferred conditions, the other members of the group are, as far as known, forms of drier areas, and in no case truly forest forms.

The pronounced development of various features in *Paulacris,* to mention the most extreme type, can hardly be considered the product of a relatively short period of evolution. It seems evident that *Paulacris, Hyalopteryx* and *Guaranacris,* or their immediate ancestors, have moved together a considerable part of their evolutionary journey, holding as they do quite a few things in common. The optimum differentiation has been reached in *Paulacris,* while *Guaranacris* is the least divergent of these three from *Allotruxalis, Eutryxalis* and *Metaleptea.*

In the course of the present study I have been able to examine material of all of the eleven species or subspecies here referred to the six genera of the Hyalopteryges except for one (*Paulacris exaggerata*). In addition to an extensive North American representation of *Metaleptea brevicornis brevicornis* which already has been analyzed by Hebard, I have examined and here record four hundred and fifty specimens of Hyalopteryges. The greater portion of this series is contained in the Philadelphia collections (i.e. Academy of Natural Sciences of Philadelphia, and the Hebard Collection there deposited), while a smaller but important representation was from the collection of Cornell University. I am greatly indebted to Dr. J. Chester Bradley for the privilege of studying the latter material.

The following key to the genera presents them in the sequence which appears to be most natural, arranged from the most specialized (*Paulacris*) to the most generalized (*Metaleptea*). This

arrangement permits a better linear classification of this and allied groups, bringing *Eutryxalis* and *Metaleptea,* the more generalized hyalopterygids, in close relationship to the Orphulae, which would follow in a linear presentation of the Neogaeic genera.

1. Retreating facial line in profile more or less concave. Fastigium in profile projecting cephalad of eyes a distance equal to or greater than the greatest dimension of the eye as seen in the same view. Antennae strongly ensiform. Pronotum of ♂ somewhat expanding caudad on the metazona (least evident in *Guaranacris*). Tegmina of ♂ sagittate, at broadest point at least 1½ times as broad as greatest width of metazonal portion of pronotal disk, and subequal to or broader than total length of pronotum. Anterior field of wings (including fenestrate area) of ♂ very broad, the breadth equal to definitely more than ¼ of greatest length of wing. Dorso-genicular lobes of caudal femora produced acute, sometimes unequal in length and occasionally sagittate. Subgenital plate of ♂ definitely longer than ventral length of preceding sternite.....2

   Retreating facial line in profile straight. Fastigium in profile projecting cephalad of eyes a distance distinctly less than the greatest dimension of the eye as seen in the same view. Antennae moderately to weakly ensiform. Pronotum of ♂ not expanding caudad on the metazona, the lateral lobes subparallel. Tegmina of ♂ elongate lanceolate, at broadest point but little broader than greatest width of metazonal portion of pronotal disk, and definitely less than the total length of pronotum. Anterior field of wings (including fenestrate area) of ♂ narrower, not broader than ¼ of greatest length of wing. Dorso-genicular lobes of caudal femora acute but less definitely produced, always equal in development and never sagittate. Subgenital plate of ♂ shorter than ventral length of preceding sternite 4

2. Fastigium in dorsal aspect and in profile blunter cephalad, its lateral margins in former view parallel for the greater portion of their length, bluntly converging cephalad. Tegmina of ♂ with apices acuminately produced, the disto-sutural margin concave. Wings of ♂ with apices of anterior field blunter, obtuse-angulate. Dorso-genicular angles of caudal femora strongly produced and markedly unequal in development, the internal ones strongly sagittate and much longer (3 times as long in *P. asinus*) than external ones. Subgenital plate of ♂ equal in length to that of venter of preceding four sternites combined. (Form definitely compressed. Tegmina of ♂ having proximal half of ulnar area with fewer anastomosing cross-nervures and consequently fewer and larger areolae. Wings of ♂ with fenestrate area having fewer (8–10) regular cross-veins. **Paulacris** new genus

Fastigium rounded to obtuse-angulate cephalad, not as blunt, in dorsal view, and in profile also, less blunted, its lateral margins in former view largely, or at least in cephalic half of their length, subangulately or arcuately converging. Tegmina of ♂ with apices acutely or subacutely produced but never acuminate, the disto-sutural margin oblique-truncate or arcuato-truncate. Wings of ♂ with apices of anterior field subrectangulate to acute. Dorso-genicular angles of the caudal femora much less strongly and subequally developed, with little if any difference in their length. Subgenital plate of ♂ never equalling ventral length of three preceding sternites combined 3

3. Pronotum of ♂ more definitely expanding caudad; caudal margin of disk more angulately produced, almost as sharp as a rectangle. Tegmina of ♂ broad, with greatest breadth contained 4 times in greatest tegminal length; reticulations of ulnar area coarser. Cephalic and median limbs quite slender, attenuate. Caudal tibiae with 17–22 external spines .....**Hyalopteryx** Charpentier

Pronotum of ♂ but little expanding caudad; caudal margin of disk less produced, broad obtuse-angulate. Tegmina of ♂ with greatest breadth contained more than 4 times in greatest tegminal length; reticulations of ulnar area finer and more closely anastomosed. Cephalic and median limbs less attenuate, more robust. Caudal tibiae with 13–15 external spines.....**Guaranacris** new genus

4. Face very strongly retreating. Antennae shorter. Lateral carinae of pronotum not cut by a transverse sulcus cephalad of the principal one. Tegmina of ♂ with apices quite sharply acute. Apices of wings of ♂ distinctly acute; fenestrate area of anterior field with fenestrae oblong (transversely), deeper than long, and transverse nervures straight, not bent.

Allotruxalis new name (= *Eutryxalis* of authors)

Face less strongly retreating. Antennae longer. Lateral carinae of pronotum definitely cut by a transverse sulcus cephalad of the principal one. Tegmina of ♂ with apices moderately acute. Apices of wings of ♂ rectangulate to subacute; fenestrate area of anterior field with fenestrae mostly quadrate or longer than deep, or transverse nervures are in part at least bent or sinuate.....5

5. Pronotal dorsum less distinctly deplanate, less sharply differentiated on the metazona from the lateral lobes, the lateral carinae of the disk less continuous and often off-set laterad on the metazona. Facial line in ♀ straight oblique. Intercalated field of tegmina in both sexes not filled with a densely and cribrosely anastomosed neuration, or with at least indications of an intercalary vein. Wings of ♂ with fenestrate area of anterior field having the fenestrae fewer and more quadrate, transverse nervures straight.

Eutryxalis Bruner (= *Paratruxalis* Rehn and authors)

Pronotal dorsum more distinctly deplanate, throughout sharply differentiated from the lateral lobes by the continuous and simple lateral carinae of the disk. Facial line in ♀ subconcave oblique. Intercalated field of tegmina in both sexes with a dense and cribrosely anastomosed neuration, without any indication of an intercalary vein. Wings of ♂ with fenestrate area of anterior field having the fenestrae more numerous and oblong (i.e. narrower than long across the wing breadth), transverse nervures bent or sinuate.

Metaleptea Giglio-Tos

PAULACRIS [7] new genus

1902. *Hyalopteryx* Burr, Trans. Entom. Soc. London, 1902, p. 183. (In part.)
1906. *Hyalopteryx* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 10. (In part.)
1906. *Hyalopteryx* Bruner, Proc. U. S. Nat. Mus., xxx, p. 622. (In part.)

The optimum development of the Hyalopteryges is found in the genus *Paulacris,* which in an arrangement of the elements of the group from the most strongly divergent to that most generalized, and thus least differentiated from other assemblages, would stand first.

In *Paulacris* the fastigium is horizontally more strongly lamellate than in the related genera of the *Hyalopteryges,* the pronotum in the male is more subsellate and subconstricted on the prozona as contrasted with the relatively expanded metazona, the tegmina are broader and sharper distad than in any other genus, the fenestrate area of the wings of the male has fewer cross-veins, hence larger and broader rectangulate "panes," and the asymmetrical development of the caudal femoral lobes, with the spicately lamellate character of the internal lobes, is most distinctive.

GENOTYPE (here selected): *Hyalopteryx asinus* Rehn.

Generic features.—Form definitely compressed and fully alate in both sexes. Surface of face, pleura, much of pronotum, of sterna and abdomen with numerous substrumose rugulae or wrinkles. Head with facial line, as seen in profile, strongly retreating, moderately concave; fastigium markedly produced and rostrate, in profile blunt acute, as seen from dorsum with apex rounded subrectangulate, lateral margins of fastigium of male in same view with proximal two-thirds straight and subparallel, thence converging to

[7] In allusion to São Paulo, the Brazilian State from which the genotypic species was described, and *ακρίς, a locust.*

distal angle, in female these margins are straight and weakly converging cephalad in proximal two-thirds, thence rounded convergent to distal angle, median carinula of fastigium weakly and incompletely indicated; frontal costa continuously marked, margins carinate, surface sulcate; lateral (supplementary) facial carinae pronounced. Eyes little prominent, basal outline ovate-subreniform in male, ovoid in female. Antennae strongly ensiform, deplanate, proximal expansion pronounced and at broadest point subequal to breadth of eye outline, in male subequal in length to that of the head and pronotum combined. Pronotum appreciably widening caudad, more markedly so in male than in female, in the former sex actually subsellate although the dorsal line is straight in profile; median and lateral dorsal carinae decided, the latter weakly sigmoid and diverging caudad in the male, straight and diverging caudad throughout in the female; cephalic margin of disk subtruncate, caudal margin slightly more obtuse than a right angle, with its angle sharply marked; principal transverse sulcus the only one cutting all three carinae; surface of discal metazona with a number of evident longitudinal and subparallel carinulae. Tegmina of male broad lanceolate, regularly widening distad from the narrow base to the distal third, where the breadth is approximately one-fourth of the entire tegminal length, apex acuminately produced; costal margin well arcuate in distal half except briefly preapically, disto-sutural margin oblique and weakly concave, passing by a distinct though rounded angle into the straight sutural margin; marginal field proximad with three longitudinal subparallel nervures, the middle one being the mediastine vein, ulnar area with few anastomosing nervures and hence few and these relatively large areolae, intercalary area with much more closely anastomosed neuration and hence much denser areolation, anal field with areolation as dense as in the intercalary area but more regular; anterior ulnar vein marked and with a sharply obtuse-angulate fork diverging toward posterior ulnar vein: tegmina of female far simpler, relatively narrow, the greatest breadth (at distal fifth) not greater than one-eighth of tegminal length, apex acute but not acuminately produced; costal margin less strongly arcuate distad than in male, disto-sutural margin straight oblique, much shorter proportionately than in male; marginal field veined as in male, ulnar and intercalary areas narrow and with heavily anastomosed neuration, but not at all areolate as in male; anterior ulnar vein simple. Wings of male with apex of anterior field very blunt, obtuse-angulate with costal side weakly and briefly concave; fenestrate area broad, having from 8 to 10 regular cross-veins, with 5 or so of the "panes" thus relatively broad, (in spread wing) transversely placed rectangles. Cephalic and median limbs slender. Caudal femora very slender and elongate; in male the dorsogenicular angles are strongly acute lobate produced and markedly unequal, the internal one strongly sagittate and exceeding twice the length of the external one, in female these angles are acute produced but of equal length; genicular lobes acute produced and of equal length in both sexes. Subgenital plate of male strongly spicate produced, slender, aciculate distad, straight, its length equal to that of the venter of the four preceding sternites combined.

Distribution.—States of São Paulo and Minas Geraes, Brazil, and eastern Bolivia (Chiquitos). The genus doubtless occurs in the State of Matto Grosso, Brazil, but no information to that effect is at present available.

Remarks.—As far as at present known *Paulacris* contains but two species, the genotypic *P. asinus* and Burr's *Hyalopteryx exaggeratus,* of which latter I have seen no material.

Paulacris asinus (Rehn) (Text-figs. 1–5; pl. V, fig. 38.)

1906. *Hyalopteryx asinus* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p 12, text-figs. 1–4. May 19, 1906. [♂ (type), ♀; São Paulo (type locality) and Jundiahy, State of São Paulo, Brazil.]

1906. *Hyalopteryx lamellipes* Bruner, Proc. U. S. Nat. Mus., xxx, p. 623. June 5, 1906. [Sex ?; São Paulo, Brazil.]

Bruner's *lamellipes* is clearly the same as *asinus,* the publication of which latter has a few weeks priority.

Of the original type pair of *asinus* I here select the male from São Paulo as the single type. Three of the four figures originally given were taken from this specimen, and also in this group the features of the male sex are of greater importance in distinguishing species.

It is now evident that *asinus* ranges from the eastern portion of the State of São Paulo (São Paulo and Jundiahy) northward to at least central Minas Geraes (Cordisburgo). It is very probable the species will be found much more widely distributed within the general area covered by these limital records than those known indicate.

Specimens examined: 6; 5 ♂, 1 ♀.

Brazil: São Paulo, State of São Paulo; ix, 14, 1900; (Hempel); 3 ♂ (*type* and *paratypes*); [A.N.S.P.]. Jundiahy, State of São Paulo; ii, 24, 1899 (♀ only); (Schrottky); 1 ♂ (*paratype*), 1 ♀ (*allotype*); [A.N.S.P.]. Cordisburgo,[8] State of Minas Geraes; xi, 7–8, 1919; (Cornell Univ. Exped.); 1 ♂; [Cornell Univ.].

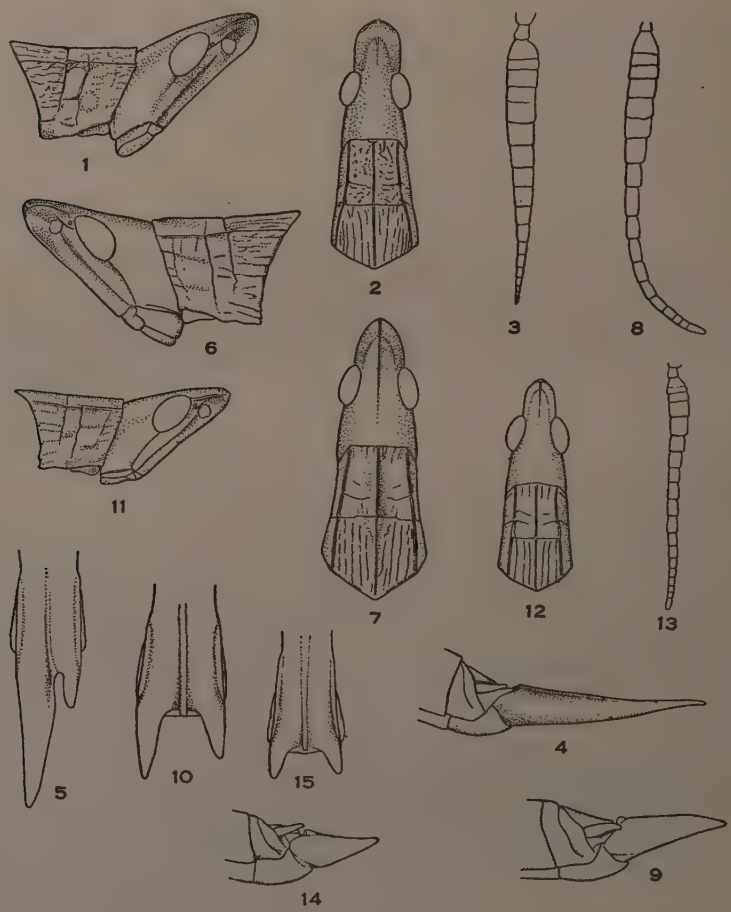
Paulacris exaggerata (Burr)

1902. *Hyalopteryx exaggeratus* Burr, Trans. Entom. Soc. London, 1902, p. 183. [♂; Chiquitos, [Bolivia]; Bolivia.]

Burr's description is relatively brief, but is sufficient to show that this species, which I have not seen, is congeneric with *asinus,*

[8] Between Sete Lagoas and Curvello, northwest of Bello Horizonte.

from which it can be separated by the citrine, instead of pale scarlet, disk of the radiate field of the wing. It also has shorter an-



Paulacris asinus (Rehn). Male (*paratype*). São Paulo, São Paulo, Brazil. Fig. 1.—Lateral view of head and pronotum (× 3). Fig. 2.—Dorsal view of head and pronotum (× 3). Fig. 3.—Antennae (× 3). Fig. 4.—Lateral view of apex of abdomen (greatly enlarged). Fig. 5.—Dorsal view of apex of caudal femur (greatly enlarged).

tennae (9.5 mm. as compared with 13.5) and shorter caudal femora (16 mm. as compared with 18.3), although the general body and pronotal dimensions are virtually the same. Actual comparison will very probably disclose other differences.

HYALOPTERYX Charpentier

1843.[9] *Hyalopteryx* Charpentier, Orth. Descr. et Depicta, pl. 46.
1911. *Hyalopteryx* Bruner, Annals Carneg. Mus., VIII, p. 8.
1913. *Hyalopteryx* Rehn, Proc. Acad. Nat. Sci. Phila., 1913, p. 312.
1915. *Hyalopteryx* Rehn, Proc. Acad. Nat. Sci. Phila., 1915, p. 281.

GENOTYPE (by monotypy): *Hyalopteryx rufipennis* Charpentier.

This genus, as here limited, contains but a single species, and in systematic position it stands between *Paulacris* and *Guaranacris,* here described. The removal from *Hyalopteryx* of authors of the elements on which these newly characterized genera are erected, makes it desirable to state those features which, by themselves or in combination, are now considered to be characteristic of *Hyalopteryx*.

Generic features.—Form definitely compressed, fully alate in both sexes. Surface of body with at most but sparse and infrequent rugulae, more largely coriaceous.

Head with facial line, as seen in profile, strongly retreating, hardly or but weakly concave; fastigium well produced and rostrate, in profile appreciably acute (♂) to rounded acute (♀), as seen from dorsum with apex narrowly rounded rectangulate, lateral margins of fastigium in both sexes in same view weakly converging distad in proximal three-fifths to the apical section, median carina distinctly but finely indicated over whole fastigial dorsum, distad reaching to border margin; frontal costa and lateral (sup-

[9] The heft of Charpentier's work containing *Hyalopteryx* was published in 1843, according to Sherborn, Index Animalium, 1801–1850.

Hyalopteryx rufipennis Charpentier. Male. Misiones, Argentina. Fig. 6.—Lateral view of head and pronotum (× 3). Fig. 7.—Dorsal view of head and pronotum (× 3). Fig. 8.—Antennae (× 3). Fig. 9.—Lateral view of apex of abdomen (greatly enlarged). Fig. 10.—Dorsal view of apex of caudal femur (greatly enlarged).

Guaranacris specularis (Bruner). Male (*topotype*). Sapucay, Paraguay. Fig. 11.—Lateral view of head and pronotum (× 3). Fig. 12.—Dorsal view of head and pronotum (× 3). Fig. 13.—Antennae (× 3). Fig. 14.—Lateral view of apex of abdomen (greatly enlarged). Fig. 15.—Dorsal view of apex of caudal femur (greatly enlarged).

plementary) facial carinae with emphasis as in *Paulacris.* Eyes little prominent, basal outline ovoid, definitely subacute dorso-cephalad. Antennae moderately ensiform in ♂, strongly so in ♀, deplanate, proximal expansion at broadest point definitely narrower than breadth of eye outline in ♂, subequal in ♀, in ♂ antennal length is slightly greater than that of head and pronotum combined, in ♀ slightly shorter than same.

Pronotum of ♂ regularly and definitely broadening caudad, of ♀ less strongly so, not sellate in either sex, dorsal line virtually straight in profile; median and lateral dorsal carinae divided, the former low tectate, the latter as a whole nearly (♂) or quite (♀) straight divergent caudad, the degree in divergence weaker in latter sex; cephalic margin of disk subtruncate, caudal margin of same with its angle sharply and finely marked, but slightly more obtuse than a right angle, with converging portions of margin subconcave; surface of metazonal disk obsoletely multilineate longitudinally with parallel very low carinuliform rugulae.

Tegmina of ♂ broad lanceolate, regularly widening distad to distal fourth, where the breadth is approximately one-fourth of the entire tegminal length, apex acute but not acuminately produced; costal margin with arcuation of distal two-fifths marked, disto-sutural margin straight oblique, passing by a narrowly rounded obtuse-angle to the straight sutural margin; marginal field veined as in *Paulacris,* ulnar area more closely yet coarsely areolate when compared with *Paulacris,* the greater number of anastomosing nervures as irregular as in that genus, intercalary area with more closely anastomosed neuration and thus denser areolation than in *Paulacris,* anal field with very densely anastomosed neuration, this slightly more involved than in the intercalary area; anterior ulnar vein much as in *Paulacris,* but with its distal rami all reaching the sutural margin far distad, and with a much less definite intimation of a more proximal one diverging sharply toward the posterior ulnar vein as in *Paulacris:* tegmina of ♀ relatively narrow, elongate lanceolate, the greatest breadth (at distal fifth) subequal to one-seventh of tegminal length, apex sharply subacuminate; costal margin much less strongly arcuate distad than in ♂, disto-sutural margin straight, so little oblique as to be virtually sublongitudinal, shorter actually and proportionately than in ♂, passing into the straight sutural margin by a slight arcuation; marginal field veined as in ♂, ulnar and intercalary areas narrow, both with very dense and subcoriaceous finely anastomosing neuration, this so dense as to produce virtually no true areolation, the intercalary area with an irregular but evident intercalary vein; anterior ulnar vein simple. Wings of ♂ with apex of anterior field broad, rectangulate, immediate converging margins straight; fenestrate area broad, having from 10 to 13 regular cross-veins,[10] with all of the "panes" thus relatively narrow (in spread wing), transversely placed rectangles: wings of ♀ narrow, greatest breadth contained approximately two and one-fourth times in their length, apices acute, very narrowly rounded at immediate point; distal half of anterior field with the areas between all principal veins costad of the median one supplied with a large number of closely placed transverse and parallel short nervures, no fenestrate

[10] These may vary in a single ♂ from 10 in one wing to 12 in the other.

area present, areolae of more caudal portions of anterior field largely subquadrate, simple.

Cephalic and median limbs slender, moderately elongate. Caudal femora similarly elongate and slender but less attenuate than in *Paulacris;* in both sexes the dorso-genicular angles are acute produced, but not truly lobate nor sagittate, the internal very slightly longer than the external one, the development similar in both sexes: caudal tibiae with 17 to 22 spines on the external margin.

Subgenital plate of ♂ spicately produced, but less so than in *Paulacris,* aciculate distad, straight or faintly curved in profile, its length equal to that of the venter of the two preceding sternites combined.

Distribution.—That of the sole known species, as presented below.

Hyalopteryx rufipennis Charpentier (Text-figs. 6–10; pl. V, fig. 39.)

1843. *Hyalopteryx rufipennis* Charpentier, Orth. Descr. et Depicta, pl. 46. [♂, ♀; Brazil.]

No illustration of this striking species, and incidentally genus, has appeared since Charpentier's rather generalized figures were published over one hundred years ago. For that reason I am giving photographs of both sexes for comparison with *Paulacris* and *Guaranacris* also here figured.

The range of *H. rufipennis* extends from eastern Rio Grande do Sul (Pelotas) and some unstated point in the State of Paraná, Brazil, westward to south-central Paraguay (Villa Rica) and the Misiones Territory of northeastern Argentina, and northward as far as Chapada, near Cuyabá, Matto Grosso, Brazil.[11] It is not as yet known from Uruguay or Bolivia, or Argentina other than the Misiones region. Whether its distribution encroaches on the northward on that of *Paulacris,* or whether they are definitely complementary to one another, remains to be determined. It is quite probable that at its western limit the area of *Hyalopteryx* impinges upon, even if it does not overlap, that of *Guaranacris.*

While there is an appreciable amount of size variation in both sexes in the Misiones series now before me, the single male individual from the State of Paraná, Brazil, at the northern limit of the species (and thus the generic) distribution, is very much smaller than any other male I have examined. Representative individuals and the Misiones extremes measure (in millimeters) as follows:

[11] Bruner, Ann. Carneg. Mus., VIII, p. 8, (1911).

	Length of body	Length of pro-notum	Greatest (caudal) width of pronotal disk	Length of tegmen	Greatest breadth of tegmen	Length of caudal femur
♂, Paraná, Brazil.....	29	6.5	3.5	27	7.4	19.8
♂, Passo Fundo, Brazil...	31.2	6.6	3.5	28	8.1	19
♂, Pelotas, Brazil.....	33.5	6.8	3.5	29.5	8.1	20
♂, Misiones, Argentina...	31.2	6.5	3.4	27.5	7.5	19
♂, Misiones, Argentina...	35.5	7.5	4	28.8	8.1	21
♂, Villa Rica, Paraguay..	37	7.6	4	31	8.3	21.5
♀, Misiones, Argentina...	39	8.4	4.2	36	5.7	24.4
♀, Misiones, Argentina...	41.5	8.4	4.4	40	6	25

When compared with that of *Paulacris asinus* or *Guaranacris specularis* the color of the wing disk in *Hyalopteryx rufipennis* is deeper and richer, nearer carmine or nopal red (of Ridgway), and less pink or rose. The infuscation of the wing is also more broadly diffused, generally involves a greater number of areolae, and is less sharply delimited proximad than in the above mentioned species of the other two genera.

Specimens examined: 17; 14♂, 3♀.

BRAZIL: [State of] Paraná; (E. D. Jones); 1♂; [A.N.S.P.]. Passo Fundo, State of Rio Grande do Sul; I, 8, 1920; (Cornell Univ. Exped.); 1♂; [Cornell Univ.]. Pelotas, State of Rio Grande do Sul; 1♂; [Hebard Cln.].

PARAGUAY: Villa Rica; VIII, 18, 1921; (Pedro Jorgensen); 2♂; [A.N.S.P.].

ARGENTINA: Misiones; I, 1911, I, 1 and 3, 1910, XII, 10 and 12, 1909; (P. Jorgensen); 9♂, 3♀; [A.N.S.P.].

GUARANACRIS[12] new genus

1906. *Hyalopteryx* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 10. (In part.)

1906. *Hyalopteryx* Bruner, Proc. U. S. Nat. Mus., XXX, p. 622. (In part.)

Of the three genera into which the restricted *Hyalopteryx* complex is here divided, this is the most generalized, and probably nearest the ancestral stock from which the marked specializations culminating in *Paulacris* have developed. This is evident in all the more obvious features, as the less extreme fastigial develop-

[12] From *Guarani*, the name of the native Indian stock of much of Paraguay, and *ακρις*, *a locust*.

ment, the simpler pronotal type, and the narrower, less sharply angulate tegmina of the male, which have a less pronounced development of the marginal field and a tegminal venation in the same sex of much simpler character, while the reduction of the spiniform development of the genicular lobes and genicular angles of the caudal femora is similarly indicative.

GENOTYPE (here selected): *Hyalopteryx specularis* Bruner.

Generic features.—Form similar to but less strongly compressed and shallower than in *Hyalopteryx,* fully alate in both sexes. Surface of pronotum and pleura with more definite and more frequent longitudinal or sublongitudinal rugulae than in *Hyalopteryx.*

Head with facial line, as seen in profile, strongly retreating, weakly concave; fastigium well produced and rostrate, in profile more rounded acute than in *Hyalopteryx,* as seen from dorsum with apex rounded rectangulate, more broadly so than in *Hyalopteryx,* lateral margins of fastigium of both sexes in same view in proximal three-fifths weakly (♀) to quite distinctly (♂) converging distad to the broadly rounded apex, median carina finely indicated over the whole fastigial dorsum, distad reaching to border margin; frontal costa and lateral (supplementary) facial carinae formed as in *Hyalopteryx* but less strongly pronounced. Eyes no more protuberant than in *Hyalopteryx,* basal outline in ♂ less ovoid than in *Hyalopteryx,* more rounded dorso-cephalad. Antennae less strongly ensiform in ♂ than in *Hyalopteryx,* as in latter expansion of same in that sex is more definitely limited to the more proximal section, the greatest breadth of the deplanation in ♂ equal to but little more than half the breadth of eye outline, in ♀ subequal to same; antennal length slightly less than the combined length of head and pronotum in both sexes.

Pronotum in both sexes less definitely or regularly widening caudad, not sellate, dorsal line straight in profile; median and lateral dorsal carinae marked, the former less decided than in *Hyalopteryx,* latter on prozona nearly as pronounced as the median one, hardly diverging caudad, on metazona the lateral carinae may be continued as a single entity, faintly diverging caudad, or replaced by two or even three parallel, somewhat lower carinae, one of which may sometimes clearly indicate the continuation of the lateral carinae, while again there is no indication of which one may logically be considered the continuation;[13] cephalic margin of disk subtruncate, caudal margin obtuse-angulate, the immediate apex sharply marked, converging arms of caudal margin in no way concave; surface of metazonal disk appreciably multicarinate longitudinally, these subparallel and usually extending from the principal sulcus to the caudal margin.

Tegmina of ♂ distinctly narrower than in *Paulacris* or *Hyalopteryx,* lanceolate, but with greatest breadth, which is at distal third, contained

[13] This condition is definitely approximating what we find as a variant in *Allotruxalis.*

nearly four and one-half times in tegminal length, apex acute but less decided than in *Hyalopteryx;* costal margin with arcuation of distal two-fifths much less decided than in *Hyalopteryx,* disto-sutural margin oblique and passing by a well-rounded obtuse-angle to the straight sutural margin; marginal field veined as in *Paulacris* and *Hyalopteryx,* ulnar area with a closely anastomosed neuration, more involved and finely divided than in either *Paulacris* or *Hyalopteryx,* on this account in no sense truly areolate, intercalary area with neuration similar to but even more closely anastomosed than in *Hyalopteryx,* anal field with very densely anastomosed neuration; anterior ulnar vein simple, distad reaching sutural margin, and lacking a definite proximal suturad directed ramus such as is developed in *Paulacris:* tegmina of ♀ narrow, elongate lanceolate, subequal in width, the greatest breadth (at three-fifths of length) less than one-seventh of tegminal length (as 4 to 30), apex acute; costal margin but moderately arcuate distad, less so than in ♂ or ♀ of *Hyalopteryx,* disto-sutural margin but moderately oblique, not at all concave, much shorter proportionately than in ♂, passing into the straight sutural margin by a low arcuation; marginal field veined as in ♂, ulnar and intercalary areas very narrow, both with dense and subcoriaceous finely anastomosed neuration, with virtually no true areolation, the rudiment of an intercalary vein may or may not be present in the intercalary area; anterior ulnar vein simple. Wings of ♂ with apex of anterior field moderately broad, subrectangulate, its more caudal converging section appreciably arcuate, the more cephalic nearly straight; fenestrate area moderately broad, somewhat narrower proportionately than in *Hyalopteryx* or *Paulacris,* having 11 to 12 regular cross-veins, with all of the "panes" relatively narrow (in spread wing), transversely placed, mostly elongate rectangles: wings of ♀ slender, greatest breadth contained approximately twice in their length, apices moderately acute, distal half of anterior field with the series of transverse short nervures placed as in *Hyalopteryx* but less numerous, less regular and covering a smaller area. Cephalic and median limbs shorter and less attenuate, more robust, than in *Hyalopteryx.*

Caudal femora proportionately shorter and stouter than in either *Paulacris* or *Hyalopteryx,* less attenuate and deeper, dorso-genicular angles acute produced, similarly developed in both sexes, but less pronounced than in *Hyalopteryx,* the internal one slightly longer than the external; caudal tibiae with 13–15 spines on the external margin.

Subgenital plate of ♂ short spicate produced, less attenuate than in *Hyalopteryx,* virtually straight, its length hardly equal to that of the venter of the two preceding sternites combined.

Distribution.—Known only from the type locality of the genotypic species, Sapucay in south-central Paraguay.

Remarks.—Of *Guaranacris* we know but a single species, the genotype *specularis.*

Guaranacris specularis (Bruner) (Text-figs. 11–15; pl. V, fig. 40.)

1906. *Hyalopteryx rufipennis* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 11. (Not of Charpentier, 1843.[14]) [Sapucay, Paraguay.]

1906. *Hyalopteryx specularis* Bruner, Proc. U. S. Nat. Mus., xxx, p. 623. [♂, ♀; Sapucay, Paraguay.]

Although more than three decades have passed since this species was described, it is as yet known only from the type locality, in which general area *specularis* apparently is not uncommon.

As the above references show I originally recorded material of this species as *rufipennis* of Charpentier. Bruner's description appeared several weeks later. We have no indication in Bruner's description of the number of specimens he examined other than the type male and female, which he measured. The extremes in size of the fair series of *specularis* now before me, measure, in millimeters, as follows:

	Length of body	Length of pronotum	Greatest (caudal) width of pronotum	Length of tegmen	Length of cauda femur
♂, Sapucay, Paraguay.....	26	4.8	2.6	20	13.5
♂, Sapucay, Paraguay.....	28	5.5	2.7	23.8	15.5
♀, Sapucay, Paraguay.....	33.5	6.8	3.4	29.3	18.6
♀, Sapucay, Paraguay.....	36[15]	7.3	3.7	32	20

Bruner's color description is based, apparently, on an individual or individuals more heavily infuscate than the average of the series now before me, the dark postocular bar mentioned by him being evident in but a portion of those in hand, a rather uniform dull testaceous being the general coloration of the majority. The dorsal aspect is sometimes darker and more brownish, however, without the development of dark postocular bars.

Specimens examined: 17; 8♂, 9♀.

PARAGUAY: Sapucay; II, 7–15, 1905, III, 6–9, 1905, XII, 15–19, 1904; (Foster); 8♂, 9♀; [Hebard Cln. and A.N.S.P.].

[14] Determination corrected by Rehn, Proc. Acad. Nat. Sci. Phila., 1907, p. 166, (1907).

[15] Apex of abdomen somewhat telescoped.

ALLOTRUXALIS [16] new name

1897. *Hyalopteryx* Giglo-Tos, Bollett. Mus. Zool. ed Anat. Comp. Univ. Torino, XII, no. 302, p. 21. (In part.) [Not *Hyalopteryx* Charpentier, 1843.]

1900. *Eutryxalis* Bruner, Second Rep. Merchants' Loc. Invest. Comm. Buenos Aires, pp. 22, 24. (In part.)

Bruner erected the present genus, distinguishing it from *Hyalopteryx* and other components of the group, but erred in specifically identifying most of the material which he referred to it. Two species were included by him, one which he called *Eutryxalis minor,* believing it to be the species called *Metaleptea minor* by Giglio-Tos in 1897,[17] while the other was described as *Eutryxalis strigata* new species. In 1906 Rehn [18] showed, from the evidence of cotypic material of Giglio-Tos' *Metaleptea minor* and specimens determined in 1900 by Bruner as *Eutryxalis minor,* that the two concepts were not even congeneric, and that the species regarded as *minor* by Bruner was really that described by Giglio-Tos in 1897 as *Hyalopteryx gracilis.* As no type species had been indicated until that time for *Eutryxalis,* Rehn proceeded to indicate as the type "*Metaleptea minor* Bruner (not of Giglio-Tos) * * * (= *Hyalopteryx gracilis* Giglio-Tos)." Unfortunately this created a situation which cannot be maintained, i.e. a genotype based upon a misidentification, and the 1906 fixation must be interpreted as fixing *Metaleptea minor* Giglio-Tos, the species Bruner said he had, as the genotype of *Eutryxalis* Bruner, even though Bruner had not properly interpreted Giglio-Tos' species. As Giglio-Tos' *Metaleptea minor* is, as has long been shown from cotypic material,[18] a member of the genus later named *Paratruxalis* by Rehn,[19] there is no alternative but to transfer *Eutryxalis* from the present entity to that called *Orphula* in error by numerous authors and named *Paratruxalis* by Rehn, with the latter name falling for the earlier *Eutryxalis.* This procedure unfortunately leaves the present genus without a name, which is here supplied by the proposal of *Allotruxalis.* The whole situation is exceedingly regrettable,

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[16] I.e. ἄλλος, *another,* and *Truxalis.*

[17] Bollett. Mus. Zool. ed Anat. Comp. Univ. Torino, XII, no. 302, p. 23, (1897).

[18] Proc. Acad. Nat. Sci. Phila., 1906, p. 15, (1906).

[19] Trans. Amer. Entom. Soc., XLII, p. 276, (1916).

and would have been avoided in 1907 if the possible complications had then been foreseen. There is no logical alternative, however, but to consider the genotype of *Eutryxalis* as fixed in 1907, and on Giglio-Tos species, which Bruner, even though in error, said he had before him. Any other course of action leads to even far greater confusion and a potentiality of instability unappreciated by the non-taxonomist.

GENOTYPE (here designated): *Hyalopteryx gracilis* Giglio-Tos, 1897.

Distribution.—Extending from as far northward as the State of Rio Grande do Sul (Passo Fundo), Brazil, the Misiones Territory of Argentina, central Paraguay (Sapucay), eastern lowland Bolivia and extreme northwestern Argentina (lower levels of Jujuy Province), southward into Argentina at least as far as the region of the Rio Colorado (according to Bruner). However, I have examined no material from south of Buenos Aires, and none from Uruguay, where, with portions of the state of Matto Grosso, Brazil, it most certainly occurs. Its vertical range extends from sea-level to approximately 3100 feet.

Remarks.—The genus *Allotruxalis* links the genera *Paulacris, Hyalopteryx* and *Guaranacris* on one hand, with *Eutryxalis* (as here understood, i.e. the equivalent of *Paratruxalis*) and, more distantly, *Metaleptea* on the other. It is, however, in a number of features definitely nearer the restricted hyalopterygoids (i.e. *Paulacris, Hyalopteryx* and *Guaranacris*) than it is to *Eutryxalis*. While more broadly distributed than any of the restricted hyalopterygoid genera, it apparently lacks the adaptability of *Eutryxalis* and *Metaleptea,* and unlike them does not penetrate into the truly tropical portions of South America.

Key to Species of the Genus Allotruxalis

Form in both sexes more slender and attenuate. Head somewhat longer; fastigium more extended cephalad and proportionately narrower, as viewed from dorsum and in profile; eyes and antennae more elongate. Tegmina and wings longer and narrower, more attenuate, tegminal apices more sharply acute, particularly in the female. Caudal femora slightly more elongate.....**gracilis** (Giglio-Tos)

Form in both sexes less attenuate, somewhat stouter (particularly in female) and deeper. Head shorter; fastigium less produced and proportionately stouter, as viewed from dorsum and in profile; eyes and antennae less elongate, shorter and proportionately stouter. Tegmina and wings less attenuate, tegminal apices acute, but less sharply so, particularly in the female. Caudal femora somewhat less elongate. **strigata** (Bruner)

Allotruxalis gracilis (Giglio-Tos)

1897. *H[yalopteryx] gracilis* Giglio-Tos, Bollett. Mus. Zool. ed Anat. Comp. Univ. Torino, XII, no. 302, p. 22. [♂, ♀; San Lorenzo, Jujuy, Argentina; Caiza,[20] Bolivian Chaco.]

No prior author has correctly recognized Giglio-Tos' *gracilis* in the forty-seven years since it was originally described. Bruner never considered he had seen Giglio-Tos' species, and in 1906 I regarded the species here called *strigata* to be *gracilis* of Giglio-Tos. The possession at this time of virtual topotypes of *gracilis* enables me to correct the earlier error, and properly compare it with that previously regarded as *gracilis*.

The two species are, apparently, geographically complementary, *gracilis* inhabiting an area along the eastern foot of the Andean uplift from at least San Juancito, Jujuy, Argentina northeastward to or beyond Santa Cruz de la Sierra, Bolivia, at elevations ranging from about 1500 to approximately 3000 feet.[21] How far it extends eastward, over lower levels, toward the range of *A. strigata,* or whether the ranges of the two impinge, is not known.

Additional material may demonstrate that Santa Cruz de la Sierra individuals are subspecifically distinct from Jujuy material, as the former are not quite so extreme in the attenuation of the head and tegmina, particularly in the female sex, as are Jujuy specimens. However, all the Bolivian material of the species now before me has been dried from alcohol and is therefore decolored and somewhat distorted and shrivelled, and without thoroughly comparable series I would merely suggest this possibility for the attention of future students. These Santa Cruz individuals, however, are *gracilis* as here understood and not *A. strigata*.

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[20] Now appearing on official Bolivian maps as Villa Ingavi.

[21] I cannot determine whether Hebard's record of *gracilis* from Escondido, Rio Pilcomayo, Formosa, Argentina (Konowia, x, p. 270, (1931)) refers to true *gracilis* or to *strigata*. The specimen was returned to the Stuttgart Museum.

The measurements (in millimeters) of representative individuals and extremes of *gracilis* are as follows:

	Length of body	Length of pronotum	Greatest (caudal) width of pronotal disk	Length of tegmen	Length of caudal femur
♂, San Juancito, Jujuy, Argentina	18	3.7	1.6	16.5	10.6
♂, Lagunillas, Bolivia	15.5[22]	3.5	1.8	15+	10.7
♂, Santa Cruz de la Sierra, Bolivia	15.2[22]	3.5	1.6	16.8	10.9
♂, Santa Cruz de la Sierra, Bolivia	15.8[22]	3.9	1.8	16	11.5
♀, San Juancito, Jujuy, Argentina	24.5	5.3	2.4	23	15.3
♀, Santa Cruz de la Sierra, Bolivia	—[23]	5.3	2.6	24	15.6
♀, Santa Cruz de la Sierra, Bolivia	—[23]	5.3	2.7	22.5	15.8

I can say little regarding coloration in this species, as all the specimens seen except the San Juancito pair have been decolored. The male of the latter is pale buffy brown washed dorsad (head, pronotum and anal field of tegmina) with pale green. The female is entirely buffy brown with numerous small speckles of darker brown, particularly in the discoidal field of the tegmina and on the internal face of the caudal femora, while the pale lateral carinae of the pronotum are relieved ventrad by a weak bar of umber. According to Giglio-Tos this species may be fusco-strigate as well as punctate, apparently as in *A. strigata.*

Specimens examined: 10; 7 ♂, 3 ♀.

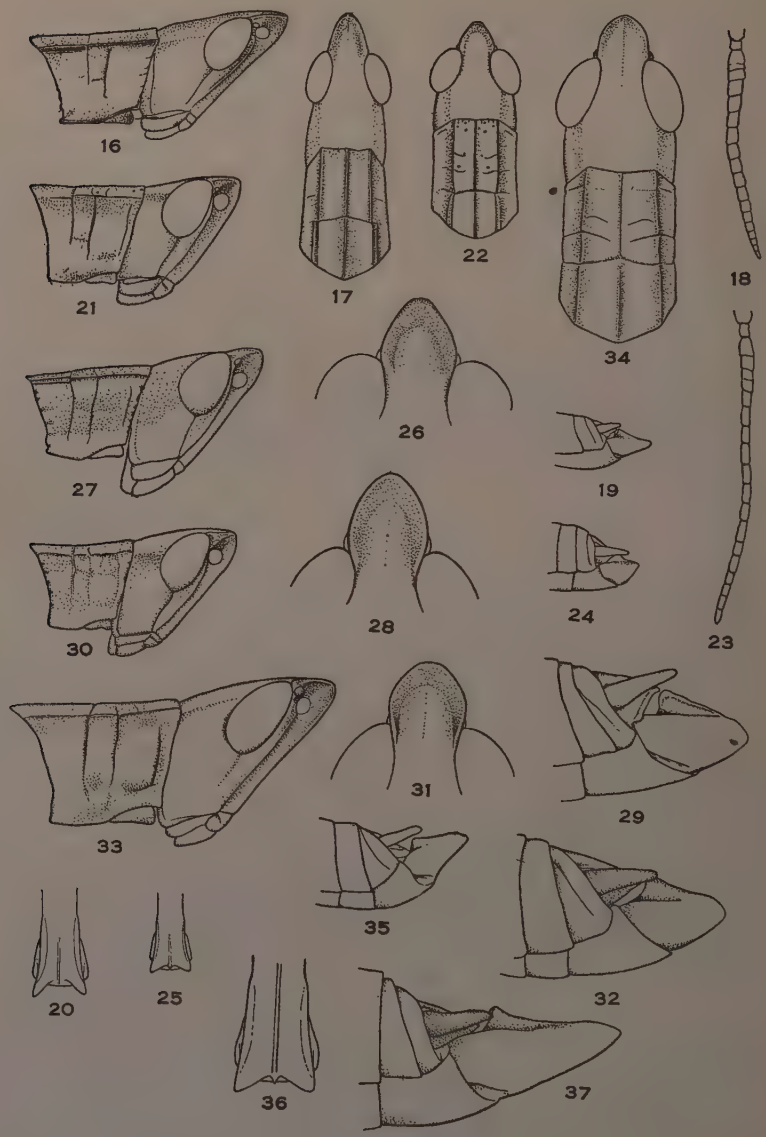
Bolivia: Lagunillas, Chuquisaca; xi, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 1 ♂; [A.N.S.P.]. Santa Cruz de la Sierra, Santa Cruz; ix, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 4 ♂, 2 ♀; [Argent. Ministr. Agric. and A.N.S.P.].

Argentina: San Juancito, Jujuy; ii, 27, 1920; (Cornell Univ. Exped.); 1 ♂; 1 ♀; [A.N.S.P.]. Yacuiba [Yacuiva], Salta[24]; xii, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 1 ♂; [Argent. Ministr. Agric.].

[22] Abdomen contracted by shrivelling.

[23] Abdomen too distorted for even approximately accurate measurement.

[24] Labelled as "Yacuiva, Bolivia," but modern maps show this locality as in Argentine territory.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Allotruxalis strigata (Bruner) (Text-figs. 16–20; pl. V, fig. 41.)

1900. *Eu[tryxalis] minor* Bruner, Second Rep. Merchants' Locust Invest. Comm. Buenos Aires, p. 24. (Not *Metaleptea minor* Giglio-Tos, 1897.) [Argentina: "Common throughout the provinces north of the Rio Colorado."]

1900. *Eu[tryxalis] strigata* Bruner, Second Rep. Merchants' Locust Invest. Comm. Buenos Aires, p. 24. [♀; Carcaraña, Santa Fé, Argentina.]

1906. *Eutryxalis gracilis* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 15. [♂, ♀; Sapucay, Paraguay.]

The nomenclatoral history of this species is chiefly one of misidentifications. Bruner first misidentified the species as that which Giglio-Tos has previously described as *Metaleptea minor*. I was able, in 1906, to show from the evidence of cotypic material of *Metaleptea minor,* and specimens determined as that species by Bruner in 1900, that the former was not congeneric with the latter,

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Allotruxalis strigata (Bruner). Male. Sapucay, Paraguay. Fig. 16.—Lateral view of head and pronotum (× 5). Fig. 17.—Dorsal view of head and pronotum (× 5). Fig. 18.—Antennae (× 5). Fig. 19.—Lateral view of apex of abdomen (greatly enlarged). Fig. 20.—Dorsal view of apex of caudal femur (greatly enlarged).

Eutryxalis filata filata (Walker). Male. Pará, Pará, Brazil. Fig. 21.—Lateral view of head and pronotum (× 5). Fig. 22.—Dorsal view of head and pronotum (× 5). Fig. 23.—Antennae (× 5). Fig. 24.—Lateral view of apex of abdomen (greatly enlarged). Fig. 25.—Dorsal view of apex of caudal femur (greatly enlarged). Fig. 26.—Dorsal view of fastigium (greatly enlarged).

Eutryxalis filata minor (Giglio-Tos). Male. Jujuy, Jujuy, Argentina. Fig. 27.—Lateral view of head and pronotum (× 5). Fig. 28.—Dorsal view of fastigium (greatly enlarged). Fig. 29.—Lateral view of apex of abdomen (greatly enlarged).

Eutryxalis filata bellula new subspecies. Male (type). Barinas, Barinas, Venezuela. Fig. 30.—Lateral view of head and pronotum (× 5). Fig. 31.—Dorsal view of fastigium (greatly enlarged). Fig. 32.—Lateral view of apex of abdomen (greatly enlarged).

Metaleptea brevicornis brevicornis (Johannson). Male. Anglesea, New Jersey. Fig. 33.—Lateral view of head and pronotum (× 5). Fig. 34.—Dorsal view of head and pronotum (×5). Fig. 35.—Lateral view of apex of abdomen (greatly enlarged). Fig. 36.—Dorsal view of apex of caudal femur (greatly enlarged).

Metaleptea brevicornis adspersa (Blanchard). Male. Urucum, near Corumbá, Matto Grosso, Brazil. Fig. 37.—Lateral view of apex of abdomen (greatly enlarged).

and that Bruner's concept of *minor* agreed with Giglio-Tos' *Hyalopteryx gracilis.* Unfortunately then I did not have paratypic or topotypic material of true *gracilis,* or I would have noted at once the considerable difference between true *gracilis* and the lower Pampan form to which I then applied that name. With both now before me the situation is quite clear.

Bruner in 1900, however, described from several females from Carcaraña, Santa Fé, Argentina, a species which he called *Eutryxalis strigata,* giving as the chief differences from what he termed *E. minor* (Giglio-Tos) a somewhat more slender body and an alternately dark brown and light testaceous striped and streaked color pattern. The species, as here interpreted, varies very considerably in color pattern, as noted beyond, although I have seen no material which directly answers Bruner's description of the coloration of *strigata.* However, this streaked and striped type occurs as a color variant in *A. gracilis,* in forms of the genera *Metaleptea* and *Eutryxalis* (as here used, i.e. equalling *Paratruxalis* Rehn) of the present group, as well as in a number of not distantly related genera, such as *Radinotatum* and *Achurum.* I therefore feel very certain that the name *strigata* was applied to a strigate color phase of this species, and am here utilizing that name for this very distinct specific entity, which is before me from the type locality.

Bruner reported *"Eutryxalis minor"* in Argentina as "common throughout the provinces north of the Rio Colorado, and quite variable in color." Material now before me shows that *strigata* as here understood ranges well to to the eastward of previously known records either as *"minor"* or *gracilis.* The peripheral points represented in the series before me are Laguna Paiva, Santa Fé Province, Argentina; Sapucay, Paraguay; Misiones, Argentina; Passo Fundo, Rio Grande do Sul, Brazil, and Buenos Aires, Argentina. Liebermann has also recorded it (as *gracilis*) from Villa Maria, Cordoba, and Las Moscas, Entre Rios, Argentina.[25] Whether *strigata* extends much northward of the localities in Santa Fé and Cordoba provinces of Argentina given above, or where the line between the two species of the genus will be found in the territory between those provinces and Jujuy and southern Bolivia, where *gracilis* occurs, is still to be determined. Clearly *strigata*

[25] Rev. Soc. Entom. Argent., x, p. 148, (1939).

is the form of the pampas and the riverine portions of eastern Argentina, and extends northward and eastward to the peripheral localities cited above. This is the first record of the genus from Brazil.

In general build the species is quite uniform, but due to a moderate amount of variation in alar length in the female sex the impression of definite bulk variation is created. This, however, is more apparent than real.

Representative specimens, and extremes of series, measure (in millimeters) as follows:

	Length of body	Length of pronotum	Greatest (caudal) width of pronotum	Length of tegmen	Length of cauda femur
♂, Passo Fundo, Brazil....	18.5	3.6	1.9	16	11.4
♂, Sapucay, Paraguay.....	19	3.5	1.7	17	11
♂, Sapucay, Paraguay.....	17.9	3.5	1.7	15.5	11.2
♂, Misiones, Argentina.....	18	3.7	1.8	16.5	11.2
♂, Carcaraña, Argentina...	16	3.5	1.7	14.6	11.4
♀, Passo Fundo, Brazil.....	26.5	5.2	2.6	25	16.3
♀, Sapucay, Paraguay.....	25.7	5.2	2.6	22	14.9
♀, Sapucay, Paraguay.....	27.5	5.3	2.6	23	15.9
♀, Misiones, Argentina.....	28.5	5	2.6	23	15.9
♀, Carcaraña, Argentina...	26.5	4.9	2.7	21.8	15.8
♀, Buenos Aires, Argentina.	25.8	5.5	2.9	24.2	17.1

In the male sex three color types are evident: one, an all green extreme, becoming brownish distad on the caudal femora and alar organs; two, with dorsum green, lateral aspects brownish; and three, an all buffy to brownish type, darker laterad. The first two are seen in males from both Sapucay, Paraguay and Carcaraña, Argentina, and the last in Carcaraña individuals of that sex. A single male from the Misiones, Argentina, also represents the all brown phase.

In the females before me four color types are evident, these being: one, an all green extreme with the alar organs and caudal femora becoming tinted with dull rose distad; two, a green form with a narrow, longitudinal brownish line mesad on the overlapping anal fields of the tegmina; three, a basically green type with the dorsal surface lightly washed with light purplish vinaceous; and four, one with green elsewhere but dorsal surface and dis-

coidal fields of the tegmina heavily and solidly colored with hay's maroon. In all phases the lateral carinae of the pronotum are pale buffy, but are conspicuous only in those contrasted forms with the dorsum darkened to some degree. The first and third female types are seen in those from Sapucay, the first, third and fourth in those from Carcaraña, and the third and fourth in Misiones females. The second type is seen only in two of the three Passo Fundo females, the other being of the all green type, as are both of those from Buenos Aires. The nearest condition observed toward the markedly strigate type on which the specific name was based, is that of the single all brown male from Carcaraña, which has the discoidal and anal fields of the tegmina longitudinally speckled, without evident strigae.

Specimens examined: 30; 11 ♂, 19 ♀.

BRAZIL: Passo Fundo, Rio Grande do Sul; I, 8, 1920; (Cornell Univ. Exped.); 2 ♂, 3 ♀; [Cornell Univ. and A.N.S.P.].

PARAGUAY: Sapucay; II, 3–III, 6, 1906; (Foster); 5 ♂, 9 ♀; [Hebard Cln. and A.N.S.P.].[26]

ARGENTINA: Misiones; I, II, XII, and XII, 14, 1910; (Pedro Jorgensen); 1 ♂, 2 ♀; [A.N.S.P.]. Laguna Paiva, Sante Fé; II, 21–23, 1920; (Cornell Univ. Exped.); 1 ♂; [A.N.S.P.]. Carcaraña, Santa Fé; (L. Bruner); 2 ♂, 3 ♀; [A.N.S.P.].[27] Buenos Aires; II, 20, 1909; (Pedro Jorgensen); 2 ♀; [A.N.S.P.].[28]

EUTRYXALIS Bruner

1870. *Chrysochraon* Walker, Catal. Derm. Salt. Coll. Brit. Mus., IV, p. 785. (In part.) [Not *Chrysochraon* Fischer, 1853.]

1894. *Orphula* Giglio-Tos, Bollett, Mus. Zool. Anat. Comp. Univ. Torino, IX, no 184, p. 8. [Not *Orphula* Stål, 1873.]

1900. *Eutryxalis* Bruner, Second Rep. Merchants' Locust Invest. Comm. Buenos Aires, pp. 22, 24.

1916. *Paratruxalis* Rehn, Trans. Amer. Entom. Soc., XLII, p. 276.

GENOTYPE (by indication of Rehn, 1906[29]): *Metaleptea minor* Giglio-Tos (= *Eutryxalis filata minor* (Giglio-Tos)).

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[26] Recorded as *Eutryxalis gracilis* by Rehn (Proc. Acad. Nat. Sci. Phila., 1906, p. 15, (1906)).

[27] Recorded as *Eutryxalis minor* by Bruner (Second Rep. Merchants' Locust Invest. Comm. Buenos Aires, p. 24, (1900)).

[28] Recorded as *Eutryxalis gracilis* by Rehn, Proc. Acad. Nat. Sci. Phila., 1913, p. 313, (1913)).

[29] Proc. Acad. Nat. Sci. Phila., 1906, p. 15, (1906). Relation to the indication of this genotype and the complications presented, see discussion under *Allotruxalis* on a preceding page (p. 198).

The present genus occupies a position intermediate between *Allotruxalis* and *Metaleptea,* and in certain features it apparently ties the latter genus to the more truly hyalopterygoid entities already treated. It can be distinguished at once from *Metaleptea* by the less deplanate pronotal dorsum, which on the metazona particularly is less sharply and continuously cut off from the lateral lobes, and by the lateral carinae of the disk in that area being less continuous and often showing the same type of off-set laterad which has been noticed in the more typical hyalopterygoid genera. The facial line in the female sex is straight oblique in *Eutryxalis,* while in the same sex of *Metaleptea* it is subconcave oblique; the intercalary field of the tegmina in both sexes of *Eutryxalis* is quite open in its neuration, generally with biseriately arranged quadrate areolations separated by a definite intercalary vein, or if the neuration of the area is more dense and less regular there is at least evidence of an intercalary vein, while in *Metaleptea* the anastomosing is compact, dense and all-inclusive, and there is no indication of an intercalary vein. The anterior field of the wings of the male in *Eutryxalis* has the fenestrae fewer and more quadrate, their isolating cross-veins straight, while in *Metaleptea* the fenestrae are more numerous, narrower and hence oblong transversely, with the separating veins bent or sinuate.

Remarks.—The genus *Eutryxalis* as here understood contains but a single species, which breaks up into three geographic subspecies. The latter show definitely divergent tendencies, and their relationship is clearly apparent only when sufficiently extensive representations are available to demonstrate their intergradation. The genus therefore would seem to be in the process of active evolution. Present information is not comprehensive enough to warrant any speculation as to its age compared with that of related genera.

Distribution.—From the Sierra Nevada de Santa Marta and the northern Cordillera Oriental of Colombia, the south slope of the Mérida Andes and upper levels of the Coastal Andes of Venezuela, lowland Trinidad, and the Belem area of Pará, Brazil, southward to the Province of Jujuy and the Territories of the Chaco, Formosa and the Misiones of Argentina, Paraguay and extreme southern Brazil (Rio Grande do Sul), westward to the eastern portion of

the Andes of Peru and Bolivia. The genus is not known from Chile or any portion of the Pacific slope of the Andean chain. The highest elevation from which *Eutryxalis* is definitely known is 2660 meters (8727 feet) at Bogotá, Colombia.

Eutryxalis filata (Walker)

This is a species of broad distribution in South America, its range coextensive with that of the genus of which it is the sole species. Areally, and to a degree altitudinally, it breaks up into three subspecies, the intergradation of which is here sufficiently established to make evident their relationship to one another. In consequence the sum total of our knowledge of the species is the aggregate of that for the various subspecies, which are here discussed individually.

The typical subspecies of *filata* has, unfortunately, been the subject of confusion with Stål's *Orphula pagana,* under which name it was recorded for a number of decades. The more important of these erroneous published determinations are cited beyond under *E. f. filata* and *E. f. minor.*

The three subspecies into which *filata* is here divided are readily recognizable on comparison of material, but, as their features of difference are largely of degree, the association of single individuals is less easy. Of the three forms typical *filata* and *f. minor* have much more extensive areas of distribution than *f. bellula,* while of the three *f. minor* has in its general habitus some suggestion of the more typical hyalopterygoid genera here preceding *Eutryxalis,* and *f. filata,* on the other hand, more recalls *Metaleptea.* However, these resemblances in no way modify the evident and demonstrable relationship of the three subspecies. In discussing them I have, for simplicity of treatment, considered the typical form (*f. filata*) first, although it apparently is as a whole more generalized than *f. minor,* which latter in a number of respects suggests more nearly *Allotruxalis.*

It is probable that *E. f. minor* is older than *E. f. filata,* and that it had spread quite widely during the time genera such as *Paulacris, Hyalopteryx, Guaranacris* and *Allotruxalis* were being developed in the south Brazilian plateau region, in Paraguay and northern and eastern Bolivia. It is conceivable this may actually have been

under way while the orogenesis which lifted the Andean region was in progress. In the lower levels of the present tropical South America, where *Metaleptea* is now, and possibly then was, broadly distributed, unknown factors modified the *filata* type into that now called *f. filata*. Whether *f. filata* or *f. bellula* is the older type remains for the future to determine. My personal feeling, drawn from our present knowledge of the history of the biota of this portion of South America, is that *E. f. filata* is the younger, but we have no specific or conclusive evidence on this point.

Key to the Forms of Eutryxalis filata

1. Size averaging smaller. Form in both sexes less compressed and not so attenuate. Eyes more prominent as seen from dorsum and in cephalic aspect. Antennae relatively short. Fastigum broader and shorter proportionately, less produced cephalad as seen in dorsal aspect, in profile fastigio-facial angle is somewhat less prominent..2

   Size averaging larger. Form in both sexes more compressed, more attenuate. Eyes less prominent as seen from dorsum and in cephalic aspect. Antennae relatively long. Fastigium narrower proportionately and more produced cephalad as seen in dorsal aspect, in profile fastigio-facial angle is somewhat more prominent. (Apices of tegmina of female strongly acute-produced. Male subgenital plate elongate subconical distad.).....**filata minor** (Giglio-Tos)

2. Eye outline, as seen in profile, less acute and more broadly rounded dorso-cephalad. Tegmina of female slightly broader, less sharply acute at apices. Male subgenital plate less produced, blunter, not definitely rostrate .....**filata filata** (Walker)

   Eye outline, as seen in profile, sharper and more acute dorso-cephalad. Tegmina of female narrower, more sharply acute at apices. Male subgenital plate more produced, subconical rostrate.
   filata bellula new subspecies

Eutryxalis filata filata (Walker) (Text-figs. 21–26.)

1870. *Chrysochraon filatus* Walker, Catal. Derm. Salt. Coll. Brit. Mus., IV, p. 785. [♂; Santarem[, Pará, Brazil].]

1894. *Orphula pagana* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Univ. Torino, IX, no. 184, p. 8. (Not *Orphula pagana* (Stål).) [Resistencia nel Chaco, Argentina; Asuncion, Paraguay.]

1900. *Orphula pagana* Bruner, Second Rep. Merchants' Locust Invest. Comm. Buenos Aires, p. 23. (Not *Orphula pagana* (Stål).) [Formosa and Chaco[, Argentina]; Asuncion[, Paraguay].]

1904. *Orphula pagana* Bruner, Biol. Cent. Amer., Orth., II, p. 73. (Not *Orphula pagana* (Stål).) [Rio de Janeiro, Brazil; Paraguay.]

1906. *Orphula pagana* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 16. (Not *Orphula pagana* (Stål).) [São Paulo, Chapada and Corumbá, Brazil; Sapucay and Asuncion, Paraguay.]

1906. *Orphula pagana* Brunner, Proc. U. S. Nat. Mus.,xxx, p. 626. (Not *Orphula pagana* (Stål).) In part only. [Paraguay, Argentina and Brazil.]

1911. *Orphula pagana* Bruner, Ann. Carneg. Mus., VIII, p. 9. (Not *Orphula pagana* (Stål).) [Corumbá and Chapada, Matto Grosso, Brazil.]

1913. *Orphula pagana* Rehn, Proc. Acad. Nat. Sci. Phila., 1913, p. 313. (Not *Orphula pagana* (Stål).) [Misiones, Argentina.]

1913. *Orphula pagana* Bruner, Ann. Carneg. Mus., VIII, p. 447. (Not *Orphula pagana* (Stål).) In part only. [Sapucay, Paraguay.]

1915. *Orphula pagana* Rehn, Proc. Acad. Nat. Sci. Phila., 1915, p. 282. (Not *Orphula pagana* (Stål).) [Misiones, Argentina.]

1916. *Paratruxalis filatus* Rehn, Trans. Amer. Entom. Soc., XLII, p. 275. [Pará, Pará, Brazil.]

1939. *Paratruxalis filatus* Liebermann, Rev. Soc. Entom. Argentina, X, p. 150. [Summary of previous records.]

The use of Walker's specific name *filata* for this insect has been fully discussed by me in the 1916 reference cited above. Walker based the name on two males, which presumably are in the collection of the British Museum (Natural History), as Kirby in his catalogue [30] starred the species as there represented by the type.

This subspecies is less attenuate in form, particularly in the female, than typical *E. f. minor,* with a broader, shorter and more rounded fastigium, a less sharply produced fastigio-facial angle as viewed in profile, and a less produced male subgenital plate. The tegmina average less acutely produced at the apices than in *E. f. minor,* but this is less fixed than the other features here mentioned.

It is evident from the series before me that the area over which this subspecies is found typical reaches its southern limit in the neighborhood of Rio de Janeiro, and a broad belt in which there is appreciable and increasing instability extends from there south and west, until from central Matto Grosso, northeastern Paraguay and the Chaco region of Argentina the material is seen to be intermediate between *E. f. filata* and *E. f. minor.* Material from the Alto Paraná area of Paraguay, from Formosa and the territory of Misiones, Argentina, is very unstable, some specimens being virtually intermediate and others merely atypical. These

[30] Synon. Catal. Orth., III, p. 118, (1910).

clearly demonstrate the penetration of the *minor* influence into the pantanal and adjacent country of Matto Grosso and adjoining more northern Paraguay, and also attest the dominance of Chaco conditions in areas west of the Rio Paraguay. Typical *filata* has been examined from as far northward as Trinidad, and I am unable to say, from lack of material, exactly where, in that general direction, *E. f. filata* passes into *E. f. bellula,* but probably this will be found to be in eastern Venezuela. We are quite without information as to the form of *filata* which occurs in the main Orinocan region, but this probably is *f. filata,* at least in the lower levels and more truly riverine sections.

In size *f. filata* shows fair geographic uniformity, although there is an appreciable amount of individual variation in the larger series from a single locality. The following measurements (in millimeters) evidence this latter trend, as well as the dimensions of representative individuals from other areas.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂, Piarco, Trinidad	14.9	2.9	12.9	9.4
♂, Pará, Brazil	16.3	3	13.8	10.1
♂, Pará, Brazil	16.9	3.4	14.1	11
♂, Piracicaba, Brazil	17.6	3.2	16.9	10.6
♂, Nova Teutonia, Brazil	16	3	15.1	10.9
♂, Sapucay, Paraguay	17.9	3.2	15	11.6
♂, Sapucay, Paraguay	18	3.4	16.3	11
♂, Misiones, Argentina	16.1	3	13.8	9.7
♂, Misiones, Argentina	17.4	3.2	14.8	9.9
♀, Long Stretch Forest, Trinidad	24.2	4.2	18.6	12.8
♀, Pará, Brazil	23.3	4.4	19.3	13.2
♀, São Paulo, Brazil	24.7	4.5	19.3	14.1
♀, Ligação, Brazil	27.2	5	23.4	15.3
♀, Sapucay, Paraguay	23.1	4.2	18.2	12.8
♀, Sapucay, Paraguay	26.2	4.9	19.5	14.6
♀, Misiones, Argentina	22.1	4	17.6	13.2
♀, Misiones, Argentina	26.4	4.9	21.5	14.7

The uniform or broken character of the lateral carinae of the pronotal disk is found to be a purely individual condition in any fair series. In six females from Sapucay, Paraguay, two have the carinae uniformly indicated and four have them broken or off-set

on the metazona, and the same ratio is found in six of the same sex from the Misiones, Argentina. Two females each from Pará, Ligação and São Paulo, Brazil, and Asuncion, Paraguay, have one of each type, while most of the females from other localities have the carinal trend broken.

A few females have the tegmina in large part finely speckled with mummy brown, these from Pará (1), São Paulo (1), Rio Grande do Sul (1), Brazil; Horqueta (1), Sapucay (1), Paraguay; Misiones (2), Argentina. The presence, or degree of emphasis when present, of velvety blackish brown lineations of the areas of the lateral carinae of the pronotal lateral carinae is entirely individual in both sexes, also the extent to which the carinae themselves may be finely lineate with pale yellowish on the velvety blackish brown. Paired longitudinal lines of blackish brown on the dorsum of the head, extending cephalad to the apex of the fastigium, may or may not be present and correlated with the infuscate lateral areas of the pronotal disk, although they are generally marked in those which have the yellowish lineations present. Maculate tegmina are not found in those with conspicuously marked lateral pronotal areas. Very probably these markings, as well as the structural character of the lateral carinae of the pronotal disk, have genetic backgrounds.

Specimens examined: 67; 29 ♂, 37 ♀, 1 juv. ♀.

Typical *E. f. filata*

TRINIDAD: Long Stretch Forest; II, 3, 1942; (D. K. Kevan, in sedge swamp savannah); 1 ♀; [Imp. Coll. Trop. Agr.]. Piarco; III, 8, 1942; (D. K. Kevan, in marshy patch); 1 ♂; [Imp. Coll. Trop. Agr.].

BRAZIL: Pará, State of Pará; (C. F. Baker); 2 ♂, 2 ♀; [A.N.S.P.]:[31] III, 12, 1926: (Bond and de Schauensee); 4 ♂, 1 juv. ♀; [A.N.S.P.]. Lassance, State of Minas Geraes; XI, 9–19, 1919; (Cornell Univ. Exped.); 1 ♂; [Cornell Univ.]. Pau da Fome, Rio de Janeiro; IX, 1, 1940; 1 ♂; [A.N.S.P.].

Atypical *E. f. filata*

BRAZIL: São Paulo, State of São Paulo; IX, 1 and 5, 1900; (A. Hempel); 2 ♀; [A.N.S.P.].[32] Piracicaba, State of São Paulo; 1 ♂; [Hebard Cln.]. Nova Teutonia (Correio Ita), State of Santa Catharina; X, 2, 1935; (Fritz

[31] Recorded by Rehn (Trans. Amer. Entom. Soc., XLII, p. 275, (1916)) as *Paratruxalis filatus.*

[32] Recorded by Rehn (Proc. Acad. Nat. Sci. Phila., 1906, p. 16, (1906)) as *Orphula pagana.*

Plaumann); 1♂; [A.N.S.P.]. State of Rio Grande do Sul; 1♀; [Hebard Cln.]. Ligação, State of Matto Grosso; XII, 6–10, 1919; (Cornell Univ. Exped.); 1♂, 2♀; [Cornell Univ. and A.N.S.P.]. Urucum, near Corumbá, State of Matto Grosso; XII, 23–29, 1919; (Cornell Univ. Exped.); 1♂; [Cornell Univ.].

PARAGUAY: Horqueta, 45 kilometers E. of Rio Paraguay; I, 12, 1934, IV, 12, 1933, XII, 7, 1933; (A. Schulze); 1♂, 2♀; [A.N.S.P.]. Asuncion; 2♂, 2♀; [A.N.S.P.].[32] Sapucay; II, 1902, 6–13, III, 6 and 19, 195; (Foster); 3♂, 6♀; [Hebard Cln. and A.N.S.P.].[32] Villa Rica; III, 1922; (Pedro Jorgensen); 1♂, 3♀; [A.N.S.P.]. Puerto Cantera;[33] XII, 1913; (C. Schrottky); 2♂, 2♀; [A.N.S.P.]

ARGENTINA: Iguazú Falls; I, 20–22, 1920; (Cornell Univ. Exped.); 1♂; [Cornell Univ.]. Misiones: IV, 30, V, 5 and 6, X, XII, 12, 1919 X, 1911; (Pedro Jorgensen); 4♂, 6♀; [A.N.S.P.][34]

Intermediate between *E. f. filata* and *E. f. minor*

BRAZIL: Chapada, State of Matto Grosso; IV; (H. H. Smith); 1♂; [A.N.S.P.].[32] Santa Rosa de Descalvados,[35] State of Matto Grosso; VII, 31, 1931; (Matto Grosso Exped.; J. A. G. Rehn, in open dry forest on thin surface cover); 2♀; [A.N.S.P.]. Corumbá, State of Matto Grosso; III; (H. H. Smith, lowland); 1♀; [A.N.S.P.].[32]

PARAGUAY: Alto Paraná; III, 1914; 1♂; [A.N.S.P.]. Puerto Bertoni, Alto Paraná;[36] 1♀; [A.N.S.P.].

ARGENTINA: Formosa, Territory of Formosa; I, 11 and 21, 1919, VI, 8, 1919 and VI, 12, 1918; (Pedro Jorgensen); 4♀; [A.N.S.P.].

Eutryxalis filata minor (Giglio-Tos) (Text-figs. 27–29.)

1897. *M[etaleptea]minor* Giglio-Tos, Bollett. Mus. Zool. Anat. Comp. Torino, XII, no. 302, p. 23. [♂, ♀; San Lorenzo[, Jujuy, Argentina]; Caiza and Aguairenda[, Bolivian Chaco].]

1906. *Orphula minor* Rehn, Proc. Acad. Nat. Sci. Phila., 1906, p. 17. [Caiza, Bolivia; Chaco.]

1906. *Orphula pagana* Bruner, Proc. U. S. Nat. Mus., XXX, p. 626. (Not *Orphula pagana* (Stål).) In part only. [Bolivia.]

1913. *Orphula pagana minor* Rehn, Proc. Acad. Nat. Sci. Phila., 1913, p. 314. [Jujuy, Jujuy, Argentina.]

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[33] This is apparently what appears as "Cantera" on large scale charts of Paraguay. It is a point about 12 miles northeast of Encarnacion, and nearly across the Rio Paraná from San Ignacio, Misiones, Argentina.

[34] Recorded by Rehn (Proc. Acad. Nat. Sci. Phila., 1913, p. 313, (1913); Idem, 1915, p. 282, (1915)) as *Orphula pagana*.

[35] Santa Rosa de Descalvados is approximately 24 miles west of Descalvados, which is in the pantanal region of the Rio Paraguay some seventy miles south of the well-known town of Caçeres.

[36] This locality is on the west side of the Rio Paraná, just south of the junction with it from the east of the Rio Iguazú.

1913. *Orphula pagana* Bruner, Ann. Carneg. Mus., VIII, p. 447. (Not *Orphula pagana* (Stål).) [Santa Cruz de la Sierra, Bolivia.]
1916. *Paratruxalis filatus minor* Rehn, Trans. Amer. Entom. Soc., XLII, p. 276. [Combination only.]
1931. *Paratruxalis filatus* Hebard, Konowia, x, p. 270. [San José, Chiquitos, Bolivia.]
1939. *Paratruxalis filatus minor* Liebermann, Rev. Soc. Entom, Argentina, x, p. 150. [Summary of previous records.]

Borelli erected *minor* on an unstated number of specimens of both sexes, of which representation a pair, received in exchange from the Turin Museum prior to 1906, are now before me. Of the three originally cited localities I here select San Lorenzo, Province of Jujuy, Argentina, the first given, as the restricted typi locality. The correct relationship of *minor* to true *filata* (then currently and erroneously called *Orphula pagana*) was pointed out by me in 1913 (vide supra).

The preceding key to the forms of the species, and the comments made under *E. f. filata,* bring out the diagnostic points of the present subspecies, the intergradation of which into typical *filata* is made abundantly evident by the series now available.

Typical *minor* is known to me from as far south as Jujuy, Province of Jujuy, Argentina, thence northward apparently along the eastern foothills of the Andean uplift and across the Chaco area of southeastern Bolivia, as far as the area immediately north of Santa Cruz de la Sierra, Bolivia, where instability begins to develop. Eastward it passes, apparently gradually, into a condition intermediate between *f. minor* and *f. filata* which is found in the vicinity of the Rio Paraguay (see under *f. filata*). Atypical *f. minor* extends northward along the lower eastern Andean slopes and the adjacent upper reaches of the Rio Mamoré (Trinidad), Bolivia, and of the Rio Perené (Chanchamayo and El Campamiento), Peru. To the northward of the latter area *E. f. minor* definitely begins to show the influence of *E. f. bellula* of northwestern South America, and material from Conchamarca in Huánuco Department, Peru, and the Caquetá region of southeastern Colombia (La Chorrera to La Sombra) is clearly intermediate between *E. f. minor* and *E. f. bellula.* I have no evidence as to where *E. f. minor* and *E. f. filata* pass into one another in the western Amazonian region, because no material of the species is

available from the lower levels in that great area. The highest elevation from which I have seen *E. f. minor,* either typical or atypical, is 6387 feet (1950 meters) at Lagunillas, Bolivia, while individuals intermediate between *E. f. minor* and *E. f. bellula* have been taken as high as 8530 feet (2600 meters) at Conchamarca, Peru. No material of *E. f. minor,* or in fact of any of the forms of *E. filata,* has been seen from west of the Andean divide.

While *E. f. minor* averages somewhat larger than *E. f. filata,* the area in which maximum size for the species develops is one in which the material is largely atypical *E. f. minor,* i.e. Cuatro Ojos, Buena Vista and Provincia Sara, Department of Santa Cruz, Bolivia. To the northward, in those parts of Peru where the passage into *E. f. bellula* is indicated, the size decreases. The following measurements (in millimeters) present the extremes of certain series and representative individuals from other localities.

	Length of body	Length of pronotum	Length of tegmen	Length of cauda femur
Typical *E. f. minor*				
♂, Jujuy, Argentina	18.4	3.5	16.9	11.7
♂, Caiza, Bolivia, *paratype*	16.9	3.4	15.3	10.9
♂, Villa Montes, Bolivia	15.9 [87]	3.2	15.4	10.1
♂, Santa Cruz de la Sierra, Bolivia	15.4	3.2	13.8	10.2
♂, Santa Cruz de la Sierra, Bolivia	17.9	3.5	15.3	11.4
♀, Bolivian Chaco	25.9	4.4	21.1	14.3
♀, Villa Montes, Bolivia	25.2	5	21.1	15.1
♀, Lagunillas, Bolivia	27.7	5.3	21.8	14.6
♀, Santa Cruz de la Sierra, Bolivia	24.4	4.7	19.3	14.3
♀, Santa Cruz de la Sierra, Bolivia	26.9	5	21.6	15.1
♀, Cuatro Ojos, Bolivia	26.5	5	21.6	14.6
♀, Cuatro Ojos, Bolivia	26.5	5.3	23.3	15.9
Atypical *E. f. minor*				
♂, Provincia Sara, Bolivia	19.9	3.7	17.2	11.4
♂, Provincia Sara, Bolivia	19.4	3.9	17.9	12.7
♂, "Yungas," Bolivia	19.5	3.9	16.4	11.9
♂, Chanchamayo, Peru	17.1	3.4	15	11
♀, Provincia Sara, Bolivia	28.8	5.3	22	16.1
♀, Provincia Sara, Bolivia	31.7	5.8	24.9	17.2
♀, "Yungas," Bolivia	29	5.3	21.3	16
♀, Chanchamayo, Peru	25.4	5	21.1	14.6
♀, Chanchamayo, Peru	26	5.3	22	15.6

[87] Abdomen slightly shrivelled—dried from wet preservative.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
Intermediate between *E. f. minor* and *E. f. bellula*				
♂, Conchamarca, Peru	18.9	3.6	15.6	12.1
♀, Conchamarca, Peru	28.2	5.2	20.2	14.6
♀, La Chorrera to La Sombra, Putamayo, Colombia	27	5.2	22.3	15.3

In coloration *E. f. minor* shows the same variant types as in *E. f. filata,* plus others not seen by me in the latter. One of these latter, represented only by a single female from Provincia Sara, is solidly suffused with dull fuscous brown, which obscures all pattern. A second, represented in its extreme condition by single females only from Provincia Sara and Buenavista, Bolivia, and Chanchamayo, Peru, has the dorsal surface of the head and pronotum almost solidly pale buff. A third has the longitudinal venation of the tegmina pencilled with darker brown; this latter varies individually in emphasis, and is strongly marked only in two females from Provincia Sara, the one from "Yungas," Bolivia, and one from Cuatro Ojos, Bolivia, and one each from Chanchamayo and Conchamarca, Peru. A single Buenavista female has the tegmina dull indian red, weaker distad, a condition such as is occasionally found in the North American *Orphulella pelidna* and the Neotropical *O. punctata.* I think there can be little question but that these color types, as with those discussed under *E. f. filatus,* have a genetic background.

Specimens examined: 69; 25 ♂, 42 ♀, 2 juv. ♀.

Typical *E. f. minor*

ARGENTINA: Jujuy, Province of Jujuy; IV, 1911; (Pedro Jorgensen); 1 ♂; [A.N.S.P.].

BOLIVIA: Yacuiva, Dept. of Tarija; VIII and XII, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 1 ♂, 1 ♀; [Argent. Ministr. Agr. and A.N.S.P.]. Caiza,[38] Dept. of Tarija; (Borelli); 1 ♂ (paratype); [A.N.S.P. ex Turin Mus.]. "Chaco"; (Borelli); 1 ♀ (one of original series); [A.N.S.P. ex Turin Mus.]. Villa Montes, Dept. of Tarija; XI, 1917; (Exped. Argent. Chaco Boliviana; Lizer and Delétang); 1 ♂, 1 ♀; [Argent. Ministr. Agr.]. Lagunillas, Dept. of Santa Cruz; (Exped. Argent.

[38] This appears on the 1934 chart of Bolivia, prepared by the Bolivian Society of Engineers, as Villa Ingavi.

Chaco Boliviano; Lizer and Delétang); 1♂; [Argent. Ministr. Agr.]. Santa Cruz de la Sierra, Dept. of Santa Cruz; II, 20–28, 1922; (José Steinbach); 3♂, 2♀; [Hebard Cln.]: IX, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 6♂, 2♀; [Argent. Ministr. Agr. and A.N.S.P.]. Cuatro Ojos, Dept. of Santa Cruz; IX and XI, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 1♂, 6♀; [Argent. Ministr. Agr. and A.N.S.P.].

Atypical *E. f. minor*

BOLIVIA: Buena Vista, Dept. of Santa Cruz; II, 3, 1922; (José Steinbach); 3♀; [Hebard Cln.]. Provincia Sara, Dept. of Santa Cruz, elev. 400–450 meters; I, 20–II, 28, 1922; (José Steinbach); 5♂, 13♀; [Hebard Cln. and A.N.S.P.]. Trinidad, Dept. of Beni; X, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 1♀; [A.N.S.P.]. "Yungas"; 1♂, 1♀; [Hebard Cln.]. "Yungas de la Paz," 1000 meters; 1♂; [Hebard Cln.].

PERU: Chanchamayo, several labelled 1000 meters; VI and XII, 1910 (no date on several); 2♂, 3♀; [A.N.S.P.]. El Campamiento, Colonia Perené; VI, 19, 1920; (Exped. Cornell Univ.); 1♂; [Cornell Univ.].

Intermediate betwen *E. f. minor* and *E. f. bellulus*

PERU: Conchamarca, Dept. of Huánuco, elev. approx. 2600 meters; XI, 4–6, 1937; (Felix Woytkowski); 1♂, 5♀, 2 juv. ♀; [A.N.S.P.].

COLOMBIA: La Chorrera to La Sombra, Putamayo drainage, Comisaría del Caquetá; VIII, 21, 1920; (Exped. Cornell Univ.); 2♀; [Cornell Univ. and A.N.S.P.].

Eutryxalis filatus bellula[39] new subspecies

(Text-figs. 30–32; pl. V, fig. 42.)

1923. *Paratruxalis filatus* Hebard, Trans. Amer. Entom. Soc., XLIX, p. 197. [Taquina, Macatama Valley, Sierra Nevada de Santa Marta, Magdalena, Colombia; Pueblo Nuevo de Ocaña, Santander, Colombia.]

This subspecies in its typical condition appears to be limited in distribution to the vicinity of the coastal mountains of north-central, and of the Mérida Andes of western Venezuela, and the Sierra Nevada de Santa Marta and at least portions of the northern sections of the Cordillera Oriental of northeastern Colombia. There is available no material from critical areas to demonstrate direct intergradation with *E. f. filata,* but this is shown to exist with *E. f. minor* by intermediate material here discussed under that subspecies, and by atypical material of *E. f. bellula* from Bogotá and Choachi, Cundinamarca, and Villavicencio, Intendencia del Meta, Colombia, now before me.

[39] I.e. *pretty* or *elegant.*

When compared with *E. f. filata* the present subspecies is seen to be somewhat smaller in the male sex, although the females are of almost equal size, the outline of the eye, as seen in profile, is somewhat more acute dorso-cephalad than in the typical form, and the subgenital plate of the male is more produced and subconically rostrate. In the female sex the apices of the tegmina may also be found to average more acute than in *E. f. filata,* but a large series of that sex of *bellula* must be available before that can be established as a diagnostic feature. From *E. f. minor* the present subspecies can be separated by a number of features, some of which also distinguish *E. f. filata* from *E. f. minor,* the more evident differences being the average smaller size, the less compressed form, less compressed and more evident eyes as seen from the dorsum, the shorter antennae, blunter and more rounded fastigio-facial angle as seen in profile, the shorter fastigium as seen from dorsum and the less longitudinal pronotum.

Type.—♂; Barinas, State of Barinas, Venezuela. January, 1943. (Pablo Anduze.) [Academy of Natural Sciences of Philadelphia, Type no. 5696.]

Size relatively small; form less attenuate proportionately than in *E. f. minor.*

Head as seen in profile with the fastigio-facial region slightly blunter and less produced cephalad than in *E. f. filata* and very definitely so when compared with *E. f. minor;* eye outline in same view less produced dorso-cephalad than in *E. f. minor,* and slightly sharper at the same point than in *E. f. filata;* as seen from the dorsum the fastigium has its distal extremity slightly more rounded, when compared with that of *E. f. filata,* and less produced and much more broadly rounded when contrasted with *E. f. minor;* when viewed in cephalic aspect the eyes are much more evident than in *E. f. minor,* and nearly as obvious as in *E. f. filata.* Antennae shorter than in *E. f. minor,* not exceeding two-thirds the length of the caudal femora, distad rather heavier than in *f. filata* or *f. minor.*

Pronotum as a whole more resembling that of *E. f. minor* than of *E. f. filata,* particularly in the general sculpture and the exact outline of the lateral lobes.

Tegmina in general form and proportions essentially as in *E. f. filata,* venation very similar. Wings much as in *E. f. filata* but with first lobation of peripheral margin slightly more roundly produced, and more cut off from the anterior field; broader fenestrate portion of anterior field of wing with relatively few (6) simple and unforked cross-nervures.

Limbs as in *E. f. filata* but slightly more slender.

Subgenital plate, as seen in profile, appreciably more produced and subacute than in *E. f. filata,* and in this outline approaching that of the same area as in *E. f. minor,* as viewed from the venter, however, less acuminately produced distad than in *E. f. minor,* and in general shape more as in *E. f. filata.*

Allotype.—♀; Los Castillitos,[40] Distrito Federal, Venezuela. Elevation, 1606 meters. February 27, 1938. (G. V. Berthier.) [Academy of Natural Sciences of Philadelphia.]

Size relatively small, subequal to that of the same sex of *E. f. filata* and definitely smaller than in *E. f. minor;* form much as in male sex.

Head with the fastigial outline as seen from the dorsum intermediate in development between those found in *E. f. filata* and *E. f. minor,* i.e. produced and more narrowly rounded than in the former, and less produced and somewhat broader than in the latter, the outline of the eyes, as seen in the same aspect, intermediate between the conditions found in the other subspecies; seen in profile the fastigio-facial angle as in the male sex, also the eye outline in this view and in cephalic aspect. Antennae with their relative length as in the male.

Pronotum as a whole, as in male, more nearly resembling that of *E. f. minor* than of *E. f. filata;* lateral lobes while more quadrate and in outline less longitudinal than in *E. f. minor,* have their surface elements proportioned as in the latter subspecies.

Tegmina more resembling those of *E. f. minor* in proportions, being more attenuate than in *E. f. filata,* with the apices more sharply acute, the areolation of the more proximal portions of the tegmina as open and no more dense than in *E. f. filata,* by no means as complex or as closely anastomosed as in *E. f. minor.*

Limbs as in male sex.

Coloration.—The color patterns found in this subspecies are, as far as available series indicate, essentially as in *E. f. filata.* All the typical individuals show a definite postocular darkening on the postocular portion of the head and the dorsal portion of the lateral lobes of the pronotum, this latter paling ventrad, while the preanal areas of the tegmina are to a greater or lesser degree more infumate than the anal field, and when this has lessened intensity, as in the male type and both females seen, there is in the discoidal field an appreciable number of darker scattered small nebulous maculae. The male paratype from Galipan, Venezuela, and the male from Taquina, Colombia, have the lateral carinae of the pronotum pencilled throughout with pale cream, while the two typical females have the same indicated, but on the prozona alone. Both atypical females from Bogotá and Choachi, Co-

[40] This is the name of a group of small peaks in the Coastal Andes between Caracas and the coast. They are approximately two miles due north of the Magallanes suburb of Caracas.

lombia, have the carinae similarly pale lined, but for their entire length, the discoidal vein of the tegmina also similarly pale pencilled,[41] while those from Villavicencia are dull with little contrasts, except for tegminal mottlings.

The general tone of the body color ranges from as light as pinkish buff overlaid with cinnamon to prout's brown markings, to as dark as citrine-drab overlaid with olive-brown to clove brown.

Measurements (in millimeters)

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
Typical *E. f. bellula*				
♂, Taquina, Colombia	—[42]	2.8	13.8	9.6
♂, Barinas, Venezuela, *type*	15.6	2.9	14	10.2
♂, Barinas, Venezuela, *paratype*	15.1	2.6	12.8	9.9
♂, Galipan, Venezuela, *paratype*	15.6	3	12.8	9.7
♀, Pueblo Nuevo de Ocaña, Colombia	23.1	4.7	19.7	13.3
♀, Los Castillitos, Venezuela, *allotype*	24.9	4.7	19.5	13.6
Atypical *E. f. bellula*				
♀, Bogotá, Colombia	25.2	5	21	15.1
♀, Villavicencio, Colombia	24.7	4.5	19.8	13.2
♀, Villavicencio, Colombia	26.8	4.7	20.2	14.5

Paratypes.—I am here considering two males bearing the same data as the type, and another male from Galipan, Venezuela, as paratypes. All of these specimens are in the collection of the Academy of Natural Sciences of Philadelphia.

Distribution.—This subspecies in its typical form is known from considerable elevations in the Coastal Andes of Venezuela, in the Sierra Nevada de Santa Marta and in the northern portion of the Cordillera Oriental of northeastern Colombia, and from lower levels along the southern base of the Mérida Andes of northwestern Venezuela. Colombian material from relatively high on the western slopes of the Cordillera Oriental in Cundinamarca, and from the eastern foot of the same in the Interdencia del Meta, show the beginnings of the passage to *E. f. minor,* and are here considered

[41] This latter condition is occasionally seen, and to a more decided degree, in *E. f. minor.*

[42] Abdomen incomplete.

atypical *E. f. bellula.* Vertically the range of this subspecies is known to extend as high typically as 1978 meters (6489 feet) at Galipan, and atypically to as great an elevation as 2660 meters (8727 feet), at Bogotá, while typically it is found as low as 180 meters (590 feet) at Barinas, Venezuela.

Remarks.—This localized subspecies may be more primitive and older than *E. f. filata,* but at present our information is too limited to warrant any hypothesis along these lines. It is, however, an inhabitant of an area of older orography than those frequented in the more northern parts of South America by either *E. f. filata* or *E. f. minor.* More information as to the full extent of its range will be awaited with interest.

Specimens examined: 11; 5 ♂, 6 ♀.

Typical *E. f. bellula*

COLOMBIA: Taquina, Macotama Valley, Sierra Nevada de Santa Marta,[43] Department of Magdalena, elevation, 6500 feet; IV, 25, 1914; (M. A. Carriker, Jr.); 1 ♂; [Hebard Cln.).[44] Pueblo Nuevo de Ocaña, Department of Norte de Santander; IX, 3, 1916; (M. A. Carriker, Jr.); 1 ♀; [Hebard Cln.].

VENEZUELA: Barinas, State of Barinas; 1, 1943; (Pablo Anduze); 3 ♂ (*type* and *paratypes*); [A.N.S.P.]. Los Castillitos, Distrito Federal, elevation 1606 meters; II, 27, 1938; (G. V. Berthier); 1 ♀ (*allotype*); [A.N.S.P.]. Galipan,[45] Distrito Federal; IV, 30, 1939; (G. V. Berthier); 1 ♂ (*paratype*); [A.N.S.P.].

Atypical *E. f. bellula*

COLOMBIA: Bogotá, Department of Cundinamarca; 1915; (A. Maria); 1 ♀; [Hebard Cln.]. Choachi, Department of Cundinamarca; V, 1915; (A. Maria); 1 ♀; [Hebard Cln.]. Villavicencio, Intendencia del Meta; 1921 and 1925; (A. Maria); 2 ♀; [Hebard Cln.].

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[43] This locality was said by Todd and Carriker (Ann. Carneg. Mus., XIV, p. 128, plate 1, (1922)) to be "a small Indian hamlet on the right bank (as one ascends) of the Rio Macotama, between San Miguel and Macotama." It is mapped by them as near the upper edge of the Subtropical Life Zone.

[44] Reported by Hebard (Trans. Amer. Entom. Soc., XLIX, p. 197, (1923)) as *Paratruxalis filatus.*

[45] "Galipan" probably refers to "El Picacho de Galipan," a peak, said to be 1978 meters elevation, in the Coastal Andes about three miles to the eastward of Los Castillitos, and similarly between Caracas and the sea-coast.

METALEPTEA Giglio-Tos

(*Truxalis* of authors, but not of Fabricius 1775, as now restricted by Latreille's 1810 designation.[46])

1893. *Metaleptea* Brunner, Ann. Mus. Civ. Stor. Nat. Genova, XXXIII, p. 118. (Invalid, no included species properly indicated.[47])

1895. *Metalepta* Bruner, Bull. Labor. Nat. Hist. State Univ. of Iowa, III, p. 63. (Preoccupied by *Metalepta* Baly, Journ. Entom. London, I, p. 205, (1861).)

1897. *Metaleptea* Giglio-Tos, Boll. Mus. Zool. Anat. Comp. R. Univ. Torino, XII, no. 302, p. 22.

GENOTYPE: As first validly used by Giglio-Tos the generic name *Metaleptea* had associated with it two species, i.e. "*M. brevicornis* Lin. Stål" and "*M. minor* n. sp." The former refers to the species which in most Orthoptera work has been associated with the generic names *Truxalis* or *Metaleptea,* and this species has been designated as the genotype of *Metaleptea* by Gurney.[48] Giglio-Tos' *Metaleptea minor* is now known as *Eutryxalis filata minor* (Giglio-Tos), and has been discussed on a preceding page.

Distribution.—From extreme southern east-central Canada across the eastern and central United States, eastern Mexico, Central America and northern, central and eastern South America to northern and north-central Argentina, but not present in the definitely elevated areas of, or on the Pacific slopes of, North or South America. It is not known from the West Indies.

Remarks.—From its present distribution, its absence from the West Indies, and presumably from Trinidad as well, *Metaleptea* can be regarded as a relatively recent invader of northern South America, Central America and those portions of Mexico and North America where it now occurs. Its spread northward apparently was made after Trinidad had been detached from the mainland of South America; that into Central America was accomplished after the establishment of the present Panama land-bridge, and its infiltration into most of Mexico and North America was subsequent to the closing of the Tehuantepec portal. It is generally agreed that neither of these diastrophic movements preceded the severing

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[46] See Roberts, Trans. Amer. Entom. Soc., LXVII, pp. 21–22, (1941).

[47] The author has consistently followed the policy that a proposed or named new genus, to be valid, must have originally included definitely and technically named species, one of which is, or subsequently could be, indicated as the genotype.

[48] Entom. Americana, (N.S.) xx, p. 92, footnote 2, (1940).

of the last Central American-Antillean connection. This would explain the apparent absence of this dominant marshland genus from the West Indies, while others of very similar habits, as *Opshomala* and *Leptysma,* are found in those islands and on Trinidad, as well as the adjacent continental areas.

The present absence of the genus from western North America and western Mexico can readily be understood as due to the ecological requirements of the genus, and the same probably is the explanation of its failure to penetrate the arid western slopes of South America in Peru and northern Chile. It is possible the future may show it occurs in suitable areas in humid coastal western Colombia, as it is now known from Boca Murindó, in the Chocó region of that country, a locality on one of the upper tributaries of the Rio Atrato (Caribbean drainage), but fifty miles in an air-line from the Pacific coast-line to the westward.

The genus contains but a single species—*M. brevicornis* (Johannson).

Metaleptea brevicornis (Johannson)

This species is probably the most broadly distributed New World locust, occurring as it does from extreme southern Canada to north-central Argentina. Over much of this great expanse it will be found in suitable environment, and those continental areas within the above limits where it is not found largely lack suitable marsh habitats, or these are isolated by great stretches of intervening and or markedly montane country.

Hebard has succinctly stated the marked ecological preference of *M. brevicornis* in the following words: "So peculiar to such environment are they, that individuals will not be seen in the region where the species is very abundant, unless the proper environment is visited." [49] Doubtless this is responsible for the rather spotty character of the information we possess regarding the distribution of the species, even when drawn from relatively extensive series such as are here listed and as previously reported from the United States by Hebard.

The species *brevicornis* is divisible into two subspecies, one possessing a less elongate male subgenital plate, found over the

[49] Trans. Amer. Entom. Soc., XLVIII, p. 106, (1922).

entire area of occurrence in North America and northeastern Mexico, while the other, with a much more elongate development of this plate, occurs in suitable environments over essentially all of the lower levels of northern, central and eastern South America east of the Andean uplift. The area of intergradation, or passage from one to the other, extends from southern (and tropical) Mexico southward to the Chocó region of Colombia.

Both subspecies of *M. brevicornis* are subject to a considerable amount of individual variation in certain structural features, and also exhibit well-marked color phases, which already have been touched upon by Hebard or are discussed under *M. brevicornis brevicornis*. Geographic size variation is also analyzed under each subspecies.

Key to Forms of Metaleptea brevicornis

Subgenital plate of male briefly conical distad, not attenuately rostrate, in profile with its greatest length not exceeding twice the cercal length.
brevicornis brevicornis (Johannson)

Subgenital plate of male produced acute conical distad, attenuately rostrate, subdigitiform, with its greatest length exceeding twice the cercal length.
brevicornis adspersa (Blanchard)

Metaleptea brevicornis brevicornis (Johannson)
(Text-figs. 33–36; pl. V, fig. 43.)

1764. *Gryllus brevicornis* Johannson, Amoen. Acad., VI, p. 398. [Sex ?; North America.]

1773. *Acrydium ensicorne* DeGeer, Mém. Hist. Ins., III, p. 499, pl. 42, fig. 7. [♀; Pennsylvania.]

1807.[50] *Truxalis notochlorus* Palisot, Ins. Rec. Afr. et Amér., p. 80, pl. 3, fig. 3. [♂; "St. Domingo" (probably in error).]

1807.[50] *Truxalis viridulus* Palisot, Ins. Rec. Afr. et Amér., p. 81, pl. 3, fig. 4. [♀; "St. Domingo" (probably in error).]

1839. *Opsomala punctipennis* Serville, Hist. Nat. Ins., Orth., p. 590. [♀; North America.]

1861. *Ox[ycoryphus] burkhartianus* Saussure, Revue et Magasin de Zoologie, (2) XIII, p. 314. [♂, ♀; Mexico.]

1871. *Opomala stenobothroides* Walker, Catal. Derm. Salt. Coll. Brit. Mus., V, Suppl. p. 52. [♂; Chontales, Nicaragua.[51]]

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[50] For dates, see Griffin, Journ. Soc. Bibliogr. Nat. Hist., I. pt. 4, pp. 121–122, (1937).

[51] Chontales material is probably intermediate between *M. brevicornis brevicornis* and *M. b. adspersa,* but I have placed the name *stenobothroides* in the present synonymy as it in no way affects the status of Blanchard's earlier *adspersa.*

It is very evident from his figures that Palisot's *Truxalis notochlorus* and *T. viridulus,* both said to be from "St. Domingo," were based respectively on the male and female sex of this subspecies. The extensive collections of West Indian Orthoptera made in the last half-century, which are now in various American institutions, contain no West Indian material of this genus or species. I can only conclude that Beauvois, who correctly recorded numerous species personally collected by him in various of our eastern states, had unwittingly given mainland material of this species as from St. Domingo, which in his case meant Haiti. His habitat notes, i.e. "les savanes humides," are quite in order, and one can only conclude there was some error or confusion in the locality credit. As Palisot by three distinct catastrophes lost virtually all of his collections, and in fact many of his notes, and as his great insect work was written in France after these various misfortunes had happened, it can readily be understood how a transposition of localities might have occurred. As other genera of identical habits, such as *Opshomala* and *Leptysma,* are included in the more comprehensive West Indian collections which have been examined, one can only conclude *M. brevicornis* is absent from the Antilles.

Size.—Hebard [52] has emphasized the progressive increase in size southward found in this subspecies within the United States, and also the extent of individual size range found at single localities within that region, all amply evidenced by the series of measurements presented by him. The measurements (in millimeters) given below are of average individuals or extremes of representations from areas outside of the United States, and should be considered as supplementing Hebard's figures drawn from United States material.

When these dimensions are considered together with Hebard's measurements of a number of North American individuals of this race, it is evident that *M. b. brevicornis* clearly reaches its size optimum in the southeastern and southern United States (i.e. southern Georgia, Florida, coastal Alabama, Louisiana and eastern Texas). Mexican specimens from higher elevations (i.e. Tianguistengo at 5550 feet, and from Orizaba) are quite small,

[52] Trans. Amer. Entom. Soc., XLVIII, pp. 104–105, (1922).

and while those from the extensive area represented by material intermediate between *M. b. brevicornis* and *M. b. adspersa* are progressively larger southward, none of these are as large as the maximum-sized specimens of either sex from the southern United States.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
Typical *M. b. brevicornis*				
♂				
6 m. N. of Ciudad Victoria, Tamaulipas, Mex.	24	4.9	21.5	15
Tianguistengo, Hidalgo, Mex.	19.3	4	18	12.9
Tianguistengo, Hidalgo, Mex.	20	4.2	19.5	13
♀				
6 m. N. of Ciudad Victoria, Tamaulipas, Mex.	39.5	7.8	30.5	22.8
Tianguistengo, Hidalgo, Mex.	34.5	6.5	27	18.9
Tianguistengo, Hidalgo, Mex.	37	7.1	27.2	20.2
Atypical *M. b. brevicornis*				
♂				
Orizaba, Vera Cruz, Mex.	19 [53]	4	18.4	13
Orizaba, Vera Cruz, Mex.	20.5	4.2	19.2	14
♀				
Orizaba, Vera Cruz, Mex.	27.5 [53]	6.3	26	18
Orizaba, Vera Cruz, Mex.	32.3 [53]	6.5	27.2	21
Intermediate between *M. b. brevicornis* and *M. b. adspersa*				
♂				
Frontera, Tabasco, Mex.	22	4	20.8	14
Frontera, Tabasco, Mex.	23.5	4.5	22.5	14.9
Morales, Guatemala	20.5	4.2	20.5	12.6
Morales, Guatemala	24	4.8	24.2	16
Carillo, Costa Rica	20.5	4	20.8	14.5
Carillo, Costa Rica	22	4.7	23	14.9
Gatun, Canal Zone, Pan.	22	4.7	21	14.5
Gatun, Canal Zone, Pan.	23	5	22.5	15.2
Boca Murindó, Colombia	21.6	4.5	21	14.2
♀				
Villa Hermosa, Tabasco, Mex.	32.8	6.6	29.2	19
Villa Hermosa, Tabasco, Mex.	36	7.1	33	20.2
Morales, Guatemala	30 [53]	6	26.2	18
Morales, Guatemala	36	7.6	33	21.2
Gatun, Canal Zone, Pan.	36	7	29.5	22
Gatun, Canal Zone, Pan.	39.5	7.1	33	21.5

[53] Abdomen definitely retracted.

Color phases.—Hebard [54] has already briefly discussed the color phases noted in North American material of this form. Basically these are green and brown, the former in the male with the lateral aspects brown, the brown females varying greatly in the depth of the tone and the density and degree of emphasis of the darker small tegminal maculae. The rarer conditions are, in females, one having the dorsum of an otherwise green phase female washed with brownish, and a second in which either the pronotal dorsum or the discoidal and anal (but not mediastine) fields of the tegmina, but not both the pronotum and tegmina, are solidly washed with purplish. These two conditions are quite unusual even in a series as extensive as that of this subspecies now before me. The darker postocular line is invariably present, but in varying strength, while the lateral carinae of the pronotal disk are always finely pale lined in the female.

Distribution.—In its typical condition *M. b. brevicornis* is known to range from the vicinity of New York City on the Atlantic Coast, extreme southern Ontario (Point Pelee), Canada and, in the interior, Fond du Lac, Wisconsin, west in the United States to the latter point, central Arkansas and central Texas (San Antonio), south to extreme southern Florida, the Gulf Coast of Alabama, Louisiana and Texas; in Mexico typically southward across the eastern areas as far as the state of Hidalgo, then continuing southward becoming atypical, and finally material from localities in the state of Tabasco is intermediate between *M. b. brevicornis* and *M. b. adspersa.* This intermediate condition is approximately maintained in representations from British Honduras, lower, truly tropical, Guatemala, and north coastal Honduras, from several quite distinct areas of Costa Rica, from the Canal Zone of Panama, and the Chocó district of Colombia (Boca Murindó).

No evidence is available to show the presence of this subspecies, or the intermediate condition, on the Pacific slope of either Mexico or Central America, except at Corozal in the Canal Zone, where normal life conditions definitely have been altered by the con-

[54] Trans. Amer. Entom. Soc., XLVIII, p. 105, (1922).

struction of the Panama Canal. In Costa Rica it has been found at suitable locations on the elevated Meseta Central, even in situations on headstreams of Pacific drainage rivers (as at San José), but is not known from the Pacific littoral even in habitats comparable to those frequented on the Atlantic side.

Specimens examined: 113; 67 ♂, 42 ♀, 1 juv. ♂, 3 juv. ♀. (This listing is exclusive of the extensive North American representation reported by Hebard in 1922,[55] and also the numerous specimens from the same area received since that date.)

Typical *M. b. brevicornis*

MEXICO: Six miles N. of Ciudad Victoria, Tamaulipas, elev. 1000 feet; VII, 21, 1936; (H. R. Roberts; swamp country); 6 ♂, 2 ♀; [A.N.S.P.]. Horsetail Falls, Monterrey, Nuevo Leon, elev. 2200 feet; VII, 27, 1938; (H. R. Roberts;) 1 ♂; [A.N.S.P.]. Tamazuachale, San Luis Potosi, elev. 500 feet; V, 26, 1937; (A. R. Mead); 1 ♂; [A.N.S.P.]. Tianguistengo, Hidalgo, elev. 5500 feet; VIII, 13, 1938; (H. R. Roberts); 4 ♂, 4 ♀; [A.N.S.P.].

Atypical *M. b. brevicornis*

MEXICO: Necaxa, Puebla; VII, 28, 1926; (H. B. Baker); 2 ♂; [A.N.S.P.]. Jalapa, Vera Cruz; 1 ♀; [A.N.S.P.].[56] Xico, Vera Cruz; VIII; (O. W. Barrett); 1 ♂; [A.N.S.P.].[57] Atoyac, Vera Cruz; IV and V; (H. H. Smith); 2 ♂; [Hebard Cln. and A.N.S.P.].[56] Fortin, klm. 329, W. of Cordoba, Vera Cruz, elev. 2500 feet; VIII, 27, 1936; (H. R. Roberts); 1 ♀; [A.N.S.P.]. Orizaba, Vera Cruz; XII, 1887; (H. Salvin and F. DuCane Godman); 3 ♂, 2 ♀; [Hebard Cln. and A.N.S.P.]:[56] I, 1892; 1 ♀; [Hebard Cln.].[56] San Rafael, Vera Cruz; (C. H. T. Townsend); 3 ♂; [Hebard Cln. and A.N.S.P.].[56]

Intermediate between *M. b. brevicornis* and *M. b. adspersa*

MEXICO: Teapa, Tabasco; II; (H. H. Smith); 1 ♂; [Hebard Cln.].[56] Frontera, Tabasco; VI, 7–11, 1928; (A. Dampf); 3 ♂, 4 ♀; [Hebard Cln.]. Villa Hermosa, Tabasco; VI, 16–18, 1928; (A. Dampf); 2 ♂, 2 ♀; [Hebard Cln.]. San Quintin, Jatate River, Chiapas, elev. 750 feet; III, 15, 1935; (D. W. Amram, Jr.); 1 juv. ♀; [A.N.S.P.].

GUATEMALA: Chiquimula; XI, 1930; (J. J. White); 1 ♀; [Hebard Cln.]. Morales; VI–VIII, 1929, VIII–X, 1930; (J. J. White); 10 ♂, 6 ♀; [Hebard Cln. and A.N.S.P.][58]

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[55] Trans. Amer. Entom. Soc., XLVIII, pp. 107–108.

[56] Recorded by Bruner as *Truxalis brevicornis* (Biol. Cent.-Amer., Orth., II, p. 36, (1904)).

[57] Recorded by Rehn as *Truxalis brevicornis* (Trans. Amer. Entom. Soc., XXVII, p. 226, (1901)).

[58] For reasons not clearly evident some of these males are almost typical *M. b. adspersa.*

British Honduras: Rio Grande; II, 1932; (J. J. White); 1♀; [Hebard Cln.]. San Antonio; VI, 1931; (J. J. White); 1♂; [Hebard Cln.]. Punta Gorda; II, 1931; (J. J. White); 7♂, 1♀; [Hebard Cln.].

Honduras: Puerto Castilla; III, 26–30, 1924; (J. Bequaert); 2♂, 1♀; [A.N.S.P.]. Corocito; IV, 1, 1924; (J. Bequaert); 1♂; [A.N.S.P.].

Nicaragua: no exact locality; (B. Shimek); 1♂; [Hebard Cln.]. San Ramon, Rio Wanks; V–VI, 1906; (M. S. Palmer); 3♀; [A.N.S.P.]. Eden; V, 12, 1922; (Wharton Huber); 1♀; [A.N.S.P.]. Great Falls, Pis Pis River, 10 m. N.W. of Eden; V, 23, 1922; (Wharton Huber); 1 juv. ♀; [A.N.S.P.].

Costa Rica: Chitaria; 1929; (M. Valerio); 1♂; [A.N.S.P.]. La Palma, between the volcanoes of Irazú and Barba, elev. 1500 meters; 1929; (M. Valerio); 2♀; [A.N.S.P.]: elev. 1600 meters; V, 1905; (P. Biolley); 1♀; [A.N.S.P.]. San José; 1929; (M. Valerio); 2♂, 1♀; [A.N.S.P.]. Carillo, above Guápiles; (Underwood); 4♂; 2♀; [Hebard Cln. and A.N.S.P.].[59] Parismina, elev. 5 meters; VII, 26, 1928; (M. Valerio); 1♀; [A.N.S.P.].

Panama: Bocas del Toro; VII, 1–10, 1908; (W. Robinson); 1♂; [Hebard Cln.].[60] La Chorrera; V, 17, 1912; (A. Busck); 1♂; [A.N.S.P.].[60] Canal Zone limits 5 m. W. of Empire; IX, 14, 1913; (Hebard); 1♂; [Hebard Cln.].[60] Corozal, Canal Zone; XII, 16, 1936; (R. Bliss); 1♀; [A.N.S.P.]. Gatun, Canal Zone; VII, 12–VIII, 5, 1916; (D. E. Harrower); 4♂, 3♀; 1 juv. ♂, 1 juv. ♀; [Hebard Cln. and A.N.S.P.][60]

Colombia: Boca Murindó, Chocó; II, 9, 1918; (M. A. Carriker, Jr.); 2♂; [Hebard Cln.].[61]

Metaleptea brevicornis adspersa (Blanchard) (Text-fig. 37.)

1846. *Truxalis adspersa* Blanchard, in D'Orbigny, Voy, Amér. Mérid., VI (2), p. 216, pl. 27, fig. 2. [♀ (from figure); Province of Santa Cruz, Bolivia.]

Blanchard's name is available for this more southern subspecies of *M. brevicornis,* material from the Santa Cruz region of Bolivia, now before me, being perfectly typical of the form for which *adspersa* is here used.

The far greater attenuation of the male subgenital plate, here used as the distinguishing feature of *M. b. adspersa,* is quite marked when typical material of the two subspecies is compared. In fair-sized series of males from a single locality one will find some little fluctuation in the exact degree of this attenuation, but

[59] Recorded as *Truxalis brevicornis* by Rehn (Proc. Acad. Nat. Sci., Phila., 1905, p. 400, (1905)).

[60] Recorded as *Truxalis brevicornis* by Hebard (Trans. Amer. Entom. Soc., L, pp. 93–94, (1924)).

[61] Recorded as *Truxalis brevicornis* by Hebard (Trans. Amer. Entom. Soc., XLIX, p. 197, (1923)).

not enough to create any uncertainty of reference. In males from Rio de Janeiro and São Paulo, Brazil, where we also find an appreciable reduction in size in both sexes, the elongation of the subgenital plate is less marked than in specimens from the Paraguay-Paraná basin, and similarly lower Amazonian and British Guianan males will sometimes have less attenuation of this plate than will be found in those from upper Amazonia or the more southern interior. The male Bolivian material examined has the extreme condition of the subspecies uniformly evident.

The color phases found in *M. b. adspersa* are the same as those already discussed under *M. b. brevicornis*.

Size.—The measurements (in millimeters) of representative individuals or extremes of series, are as follows:

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂				
Bartica, British Guiana	23.3	4.4	19	14.3
Pará, Pará, Brazil	20	3.9	17.6	12.4
Pará, Pará, Brazil	24	4.7	21.5	15
Rio de Janeiro, Brazil	18.3	3.7	16.3	12.9
Rio de Janeiro, Brazil	22	4.2	19.2	13.7
São Paulo, São Paulo, Brazil	20	3.6	17.5	12.1
Uruguayana, R. G. do Sul, Brazil	23.6	4.8	23.5	14.6
Urucum, Matto Grosso, Brazil	24.9	5	23	15.1
Napo River, Peru	22.9	4.4	20	15
Iquitos, Peru	21.3	4	17.6	13.7
Provincia Sara, Bolivia	24	4.5	21	14
Cuatro Ojos, Bolivia	19.2 [62]	3.9	18	12.2
Villa Rica, Paraguay	25	5	24.8	16
Sapucay, Paraguay	21.8	4.2	20	13.2
Sapucay, Paraguay	25.3	4.7	22.8	14.7
Misiones, Argentina	23	4.4	22.4	14.5
Formosa, Argentina	23.9	5.2	24	15.2
Catamarca, Argentina	23	4.5	22	13.7
Cosquin, Córdoba, Argentina	21.9	4.4	21	13.5
Tigre, Buenos Aires, Argentina	21.9	4.4	20.5	14.2
Tigre, Buenos Aires, Argentina	24	4.8	23	15
♀				
Bartica, British Guiana	31.9	6	24.2	18.9
Bartica, British Guiana	35.6	6.6	27.5	21
Obidos, Pará, Brazil	32.5	6	28.7	18.9

[62] Apex of abdomen strongly recorded. Specimen dried from wet preparation.

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
Obidos, Pará, Brazil	37	7.1	32.3	22
Petropolis, Rio de Janeiro, Brazil	31	7	24	20
Petropolis, Rio de Janeiro, Brazil	37	7.1	28	20.9
Uruguayana, R. G. do Sul, Brazil	35.5	7.4	33	22
Corumbá, Matto Grosso, Brazil	40	8.2	36	22.3
Descalvados, Matto Grosso, Brazil	34.5	6.3	30.5	19.5
Upper Rio Tapiche, Amazonas, Brazil	35.5	6.5	27	21
Sapucay, Paraguay	33	6.1	27.5	18.3
Sapucay, Paraguay	34.5	6.5	31.5	20
Formosa, Argentina	38.5	7.1	32.5+	21
Formosa, Argentina	38	7.6	34.5	22
Catamarca, Argentina	37	7.3	30.5+	21.2
Cosquin, Córdoba, Argentina	39	7	33	21
Tigre, Buenos Aires, Argentina	37	6.5	28	21
Tigre, Buenos Aires, Argentina	37.3	7.5	31.5	21

As here shown the individual size range is considerable in both sexes at any locality represented by a fair series, but there are also some quite definite regional correlations. When these dimensions, and their averages, are compared with those given by Hebard for North American material of *M. b. brevicornis*,[63] and on a preceding page of Mexican and Central American individuals of that subspecies and intermediates between it and *M. b. adspersa,* it is evident that the maximum size attained by individuals of *M. brevicornis* is found in individuals of both sexes from the southern and southeastern United States. The areas in South America in which these North American maxima are more nearly approximated are the relatively low levels and pantanal or swamp interspersed plains along or adjacent to the Paraguay, Paraná and Uruguay Rivers in Matto Grosso and Rio Grande do Sul, Brazil, Paraguay and northern Argentina. In southeastern Brazil, in the region of Rio de Janeiro and São Paulo, we find a relatively uniform decrease in size, and the same is true, but to a lesser degree, with material from the Amazon Valley.

The hypothesis that *Metaleptea* originated in the southern half of South America and moved northward, appears to me to receive definite support from the figures now available on size range in

[63] Trans. Amer. Entom. Soc., XLVIII, pp. 104–105, (1922).

the single species of the genus. In the southern United States the genus entered an area more nearly approximating, in its environmental and seasonal conditions, that of the Paraná drainage, than any extensive section of the intervening country. Apparently the lowland tropical environment of the Amazon Valley is not productive of optimum-sized individuals, and the more elevated or rugged coastal or near coastal stretches of southern Brazil in the Rio de Janeiro and São Paulo areas, show evidence of the same reaction.

Distribution.—Typically *M. b. adspersa* ranges from British Guiana and the Amazonian areas of eastern Peru, and probably of Colombia and Ecuador, southward to extreme southern Brazil, across Bolivia and Paraguay, and southward over Argentina to at least the general vicinity of Buenos Aires. Bruner [64] considered it (i.e. *brevicornis*) ranged south in Argentina to "the Rio Colorado, especially along the eastern border." Westward it is not known to penetrate any of the east slope Andean valleys, and it is entirely unknown from Chile, as well as other Pacific littoral areas. I have seen no material from Trinidad, Venezuela, Ecuador or Uruguay, but doubtless it occurs in most of these regions, and in Venezuela may even be atypical of *adspersa*. The single known Colombian locality, represented by intermediate material, is discussed under *M. b. brevicornis*. The area of intergradation of *M. b. brevicornis* and *M. b. adspersa* is discussed under the former.

Specimens examined: 116; 62 ♂, 50 ♀, 2 juv. ♂, 2 juv. ♀.

Typical *M. b. adspersa*

BRITISH GUIANA: Bartica; v, 2–5, 1901; (R. J. Crew); 1 ♂, 1 ♀; [A.N.S.P.]: [65] I, 8 and II, 12, 1913; (H. S. Parish); 2 ♀; [A.N.S.P.]. Kartabo; (W. Beebe); 1 ♂, 2 ♀; [N. Y. Zool. Soc.].

DUTCH GUIANA: Zanderij Island, Boven Para District; IV, 19, 1927; (Cornell Univ. Exped.); 1 ♀; [Cornell Univ.].

BRAZIL: Pará, State of Pará; (C. F. Baker); 1 ♂; [A.N.S.P.]: [66] VII, 7, VIII, 8, 1919; (H. S. Parish); 2 ♂; [A.N.S.P.]: III, 3 and 9, 1926; (Bond and de Schauensee); 3 ♂; [A.N.S.P.]. Rio Inhangapy, State of Pará; III, 5, 1926; (Bond and de Schauensee; "in capoeira"); 1; [A.N.S.P.].

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[64] Second Report Merchants' Locust Invest. Comm. Buenos Aires, p. 23, (1900).

[65] Recorded as *Truxalis brevicornis* by Rehn (Proc. Acad. Nat. Sci. Phila., 1906, p. 16, (1906)).

[66] Recorded as *Truxalis brevicornis* by Rehn (Trans. Amer. Entom. Soc., XLII, p. 275, (1916)).

Obidos, State of Pará; VIII, 26–IX, 22, 1919; (H. S. Parrish); 1♂, 3♀; [Hebard Cln. and A.N.S.P.]. Manáos, State of Amazonas; V, 20 and 27, 1919; 1♂, 1♀; [A.M.N.H.]. Rio Autaz, State of Amazonas; IX and X; (Roman); 1♂, 1♀, 1 juv. ♀; [Stockholm Mus.]. Teffe, State of Amazonas; XII, 16 and 27, 1920; (H. S. Parish); 1♂, 1♀; [Hebard Cln.]. Diamantina, State of Minas Geraes, XI, 14–18, 1919; (Cornell Univ. Exped.); 1♂; [Cornell Univ.]. Pirapora, State of Minas Geraes; XI, 11–13, 1919; (Cornell Univ. Exped.); 1♀; [Cornell Univ.]. Rio de Janeiro; X, 1919; (Cornell Univ. Exped.); 2♂, 1♀; [Cornell Univ.]: VI, 30; (T. D. A. Cocherell); 1♂; [A.N.S.P.]. Tijuca, Rio de Janeiro; IV, 9–11, 1913; (Malcolm Burr); 1♂; [A.N.S.P.].[67] Petropolis, State of Rio de Janeiro; IV, 12–14, 1913; (Malcolm Burr); 1♂, 2♀; [A.N.S.P.].[67] São Paulo, State of São Paulo; IX, 7 and 14, 1900; (A. Hempel); 4♂, 2♀; [A.N.S.P.].[65] Jundiahy, State of São Paulo; (Schrottky); 1♀; [A.N.S.P.].[65] Bocaina, State of São Paulo; IV, 1924; (R. Spitz); 1♀; [Mus. Paulista]. Uruguayana, State of Rio Grande do Sul; I, 10, 1920; (Cornell Univ. Exped.; R. G. Harris); 1♂, 1♀; [Cornell Univ.]. Corumbá, State of Matto Grosso; III; (H. H. Smith; "lowland"); 2♂; [A.N.S.P.]:[65] XI, 14–23, 1919; (Cornell Univ. Exped.; R. G. Harris); 1♀; [Cornell Univ.]. Urucum, near Corumbá, State of Matto Grosso; XII, 23–29, 1919; (Cornell Univ. Exped.); 1♂; [A.N.S.P.]. Camp 20 miles south of Santa Rosa de Descalandos, State of Matto Grosso; VIII, 14, 1931; (Matto Grosso Exped.; Rehn; "at light at night in pantanal"); 1♀; [A.N.S.P.].

PERU: Contamana, Rio Ucayali, Department of Loreto; X–XII, 1912; 1♂; [A.N.S.P.]. Upper Rio Tapiche,[68] Department of Loreto; XII, 9, 1923; (H. Bassler); 1♀; [A.M.N.H.]. Iquitos, Department of Loreto; V, 4 and 5, 1920; (H. S. Parish); 2♂; [Hebard Cln.]. Napo River, Department of Loreto; VI, 11, 1920; (H. S. Parish); 1♂; [A.N.S.P.].

BOLIVIA: Provincia Sara; 1922; (J. Steinbach); 1♂; [Hebard Cln.]. Cuatro Ojos, Department of Santa Cruz; IX and XI, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 2♂; [Argent. Ministr. Agr. and A.N.S.P.]. Lagunilla, Department of Santa Cruz; XI, 1917; (Exped. Argent. Chaco Boliviano; Lizer and Delétang); 4♂, 2♀; [Argent. Ministr. Agr. and A.N.S.P.].

PARAGUAY: Villa Rica; I, 15, 1921; (Pedro Jorgensen); 1♂; [A.N.S.P.]. Sapucay; II, 10–27, III, 2–21, 1905; (Foster); 5♂, 8♀; [Hebard Cln. and A.N.S.P.].[65]

ARGENTINA: Misiones; IV, 19, 1909; (Pedro Jorgensen); 1♂; [A.N.S.P.].[69] Posadas, Misiones; I, 15–24, 1920; (Cornell Univ. Exped.); 1♂; [Cornell Univ.]. Formosa, Formosa Territory; III, 14, 1919, VII, 23, 1918,

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[67] Recorded as *Truxalis brevicornis* by Rehn (Trans. Amer. Entom. Soc., XLIII, p. 344, (1917)).

[68] The Rio Tapiche is a tributary of the lower Rio Ucayali, entering that stream from the east at approximately 5° S., 74° 8′ W.

[69] Recorded as *Truxalis brevicornis* by Rehn (Proc. Acad. Nat. Sci. Phila., 1913, p. 313, (1913)).

XII, 20, 1917; (Pedro Jorgensen); 1 ♂, 2 ♀; [A.N.S.P.]. Catamarca; 1 ♂, 1 ♀; [Hebard Cln.]. Cosquin, Sierra de Córdoba, Province of Córdoba; III, 1–9, 1920; (Cornell Univ. Exped.); 2 ♂, 3 ♀; [Cornell Univ. and A.N.S.P.]. Buenos Aires; 1 ♂; [A.N.S.P.]: II, 14 and 26, 1909; (Pedro Jorgensen); 3 ♀; [A.N.S.P.].[69] Tigre, Province of Buenos Aires; II, 8, 1920; (Cornell Univ. Exped.); 12 ♂, 5 ♀, 2 juv. ♂, 1 juv. ♀; [Cornell Univ. and A.N.S.P.].

Explanation of Plate V

Fig. 38.—*Paulacris asinus* (Rehn). Male (paratype). São Paulo, São Paulo, Brazil. Dorsal view. (× 1½.)

Fig. 39.—*Hyalopteryx rufipennis* Charpentier. Male. Misiones, Argentina. Dorsal view. (× 1½.)

Fig. 40. *Guaranacris specularis* (Bruner). Male (topotype). Sapucay, Paraguay. Dorsal view. (× 1½.)

Fig. 41.—*Allotruxalis strigata* (Bruner). Male. Sapucay, Paraguay. Dorsal view. (× 2⅔.)

Fig. 42.—*Eutryxalis filata bellula* new subspecies. Male type). Barinas, Barinas, Venezuela. Dorsal view. (× 2⅔.)

Fig. 43. *Metaleptea brevicornis brevicornis* (Johannson). Male. Anglesea, New Jersey. Dorsal view. (× 2.)

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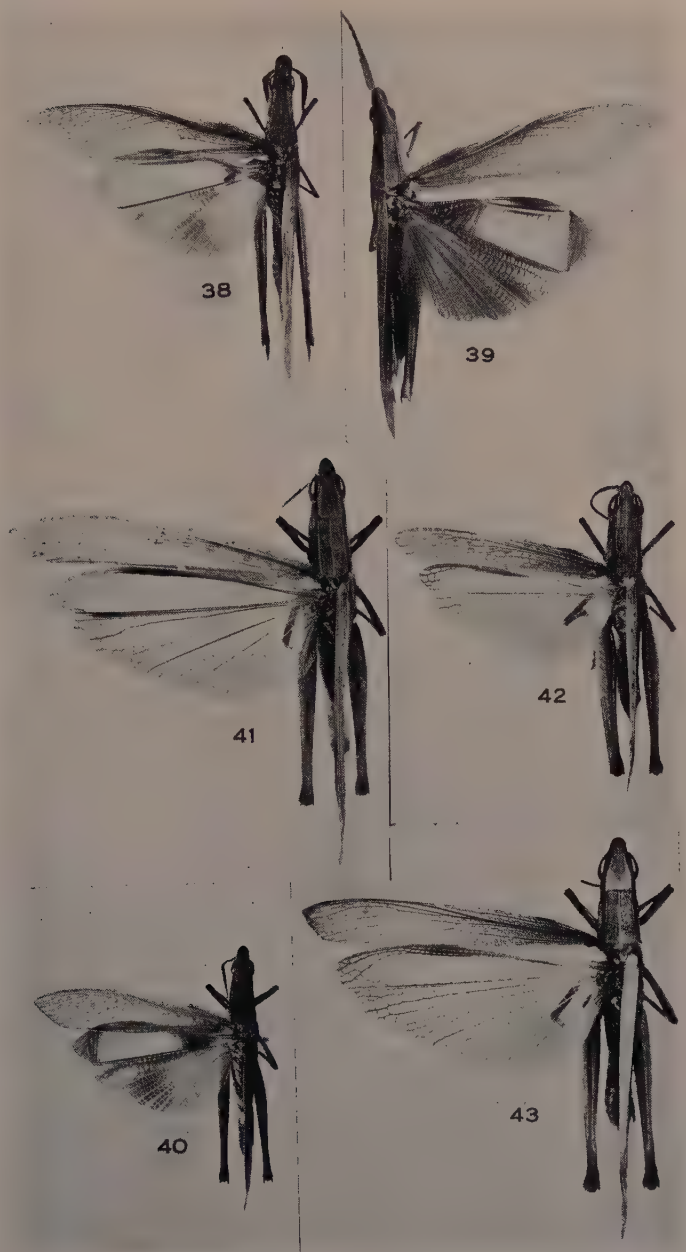

REHN—REVISION OF HYALOPTERYGES

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SINOCHLORA, A NEW TETTIGONIID GENUS FROM CHINA WITH DESCRIPTION OF FIVE NEW SPECIES

(ORTHOPTERA)

BY E. R. TINKHAM

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(Plates VI and VII)

The material upon which these descriptions is based, came from the following Collections: Hebard Collection in the Academy of Natural Sciences of Philadelphia, twenty-six specimens; United States National Museum in Washington, fifteen specimens; Heude Museum of L'Aurora University in Shanghai, China, seven specimens; Tinkham Collection, forty-six specimens, comprising a total of ninety-four specimens. The writer wishes to thank Mr. Morgan Hebard of the Academy of Natural Sciences of Philadelphia, Dr. Ashley B. Guerney of the United States National Museum and Father Octave Piel, Director of the Heude Museum, for the loan of these specimens.

SINOCHLORA new genus

Most closely allied to *Holochlora* Stål but differing from that genus in the following important details: female with the blade of the ovipositor equally broad throughout, the upper valvulae strongly truncate at the apex, the truncate portion only strongly denticulate, whereas in *Holochlora* the dorsal valvulae bear, if at all, only slight evidence of truncation with the entire upper margin denticulate; subgenital plate in *Sinochlora* is cleft at the apex whereas in *Holochlora* females of most species possess a triangular plate uncleft at the apex. The males of *Sinochlora* differ from *Holochlora* males by possessing, instead of the pair of knob-like

processes typical of *Holochlora,* a pair of forcipate processes on the supra-anal plate which also bears a median knob-like swelling which in one species is enormously produced. Male subgenital plate in *Sinochlora* broader, more deeply cleft and from moderately to very strongly arcuately reflexed, whereas in *Holochlora* the subgenital plate is usually strongly constricted and parallel-sided in the apical half, the apices bearing long styli. *Sinochlora* is further characterized by the strong black femoral spines and the black and white costal vein at the base of the tegmina; in *Holochlora* the femoral spines are not conspicuously black and the base of the tegmina concolorous with the rest of the tegmina.

Description.—Size large, equal to or slightly larger than in *Holochlora,* females of more graceful build than females of *Holochlora.* Color deep foliage green although alcoholic specimens are bleached whitish and poorly preserved specimens discolored or pale green. The costal vein of the tegmina is white, anteriorly edged with black; this diagnostic feature is not found in any other genera of the group Holochlorae. Antennae long and fine reaching beyond the apices of the tegmina. Other features of the head and pronotum similar to *Holochlora* with the tegmina slightly longer. Leg spination as follows: fore legs with fore femora bearing 5 to 7 black appressed spines on the lower internal keel; fore tibiae with 4 to 5 external and 4 to 6 internal ventrals and 0 to 6 external dorsals. Middle legs with meso-femora with 4 to 5 external spines on lower keel; meso-tibia with 6 to 9 internal and 12 to 14 external ventrals and 1 to 5 external and 7 to 8 internal dorsals. Caudal femora with 6 to 10 external and 8 to 11 internal black appressed teeth on the inferior keels. Caudal tibiae with 22–36 external and 30–41 internal teeth on the dorsal keels and 17–25 external and 9–17 internal teeth on the ventral surface.

Genitalia: Female ovipositor strikingly different from other genera of the group Holochlorae, by having the apex of the upper valvulae truncate and the basal portion out to the truncation of uniform width; the truncate portion only, denticulate. In *Holochlora* the ovipositor (pl. VII, fig. 6) decreases gradually in width distally, the entire dorsal margin of the upper valvulae denticulate. With *Liotrachela* and the larger *Symphaestria,* the new genus is not likely to be confused. Ventral valvulae in *Sinochlora* strongly denticulate in the apical portions as typical of the group. Subgenital plate rectangular to variously triangular with small to large median triangular incision of the apex; in most species of *Holochlora,* the subgenital plate though triangular is not apically notched. Male supra-anal plate diagnostic; lacking the strongly swollen knobs in *Holochlora* and possessing instead two lateral forcipate finger-like processes and a central process that may be barely evident in some species, slightly more tumid in others and in one species, the most divergent member of the genus, remarkably elongate and thus dwarfing the lateral ones. Subgenital plate more extenuate and

deeply cleft than in *Holochlora,* gently to strongly recurvate in the apical half when viewed in lateral profile. Viewed from above, these arms of the subgenital plate vary from narrow to widely separated prongs. Epiprocts greatly developed and capable in all but one species of passing upwards beyond the central posterior margin of the supra-anal plate; in *Holochlora* the epiprocts are very small and seen with difficulty.

GENOTYPE: *Sinochlora kwangtungensis* new species here described.

The new genus *Sinochlora* is endemic to the mountainous areas of central and southern China.

Key to the Chinese Species of Sinochlora

1. Male with central portion of supra-anal plate lengthily produced and covering the epiprocts; the lateral processes of the plate present as a small downward projecting prominence. Subgenital plate only gently recurved in apical third. Female subgenital plate quadrangular with a large triangular incision in the apical third. Kwangtung, Yunnan, Szechwan ..... **sinensis** new species

   Male with central portion of supra-anal plate not lengthily produced beyond the apices of the lateral processes of the plate which are large and forcipate; the bifurcate epiprocts with two acute apical prongs are capable of passing upwards between these lateral processes of the supra-anal plate. Female subgenital plate triangular with a small apical incision 2

2. Size larger than average for genus. Subgenital plate large, broadly triangular, with strongly convex lateral margins and with an acute triangularly incised apex. Male unknown. Hainan. **hainanensis** new species

   Size average for genus. Subgenital plate smaller, triangular with practically straight lateral margins 3

3. Male subgenital plate with apical fourth incised; the forked processes gently recurved. Female subgenital plate short and very broadly triangular, with a broad shallow triangular notch at the apex. Kwangtung ..... **kwangtungensis** new species

   Male subgenital plate very deeply incised to near the base; the forked processes of the plate strongly arcuately recurved. Female subgenital plate not short and broadly triangular, but equilaterally triangular... 4

4. Central portion of male supra-anal plate flat. Female subgenital plate with a triangular apical notch. Kiangsu.... **kiangsuensis** new species

   Central portion of male supra-anal plate with a raised prominence directed dorso-caudad. Buttresses of female ovipositor piceous (concolorous in other species). Female subgenital plate with a narrow triangular apical notch. Szechwan..... **szechwanensis** new species

Sinochlora kwangtungensis new species.

(Pl. VI, fig. 1, 7; pl. VII, fig. 1, 10.)

An average sized species of the genus distinguished by the following features: subgenital plate in the male only moderately cleft with the arms slightly recurved; supra-anal plate with the median process strongly elevated (seen in profile) and the posterior margin of the median process, when viewed from above, approximating the apices of the lateral processes of the plate; female subgenital plate characterized by being short and broadly triangular with a small triangular incision in the apex.

Type.—♂; Maan Chi Shan, Kwangtung, South China. October to December, 1921. (C. W. Howard.) [Hebard Collection, Type no. 1365.]

Description.—Size and form typical and average for the genus. Leg spination as follows: fore legs with the fore femora bearing 5 blackish teeth on the inferior internal keel; fore tibiae with 5 external and 6 internal spines on the ventral keels and without spines on the dorsal surface. Middle legs with the meso-femora bearing 4 external black teeth on the inferior margin; meso-tibiae with 12 to 13 external and 9 internal spines on the ventral keels and with 1 to 3 minute external spines on the dorsal side. Caudal femora with 6 to 8 external and 8 to 9 internal black teeth on the inferior keels; caudal tibiae with 34 to 36 external and 35 to 38 internal teeth on the dorsal keels and 22 to 24 external and 15 to 16 internal spines on the ventral keels. Genitalia with the lateral arms short and forcipate; the median process large and elevated with its posterior margin approximating the apices of the lateral arms of the supra-anal plate. Cerci acuminate, hairy, gently recurved in the apical third and with an acute apex. Subgenital plate rapidly constricted beyond the base, the apical two-thirds with the lateral margins parallel and with the median apical cleft running half-way to the base of the narrowed portion of the plate; arms of the plate gently recurved, when viewed in lateral profile, and bearing small apical knob-like styli.

Measurements in millimeters: body length 24; length to tip of genitalia 27; length to wing apices 52; pronotum 5.5; tegmina 47 × 8.5.

Allotype.—♀; same data as the type; [Hebard Collection].

Description.—Slightly larger and heavier than the type but otherwise similar. Size, the same as *szechwanensis* new species and *sinensis* new species, slightly smaller than *kiangsuensis* new species and considerably smaller than *hainanensis* new species. Leg spination as follows: Fore legs with the fore femora bearing 6 black appressed teeth on the internal inferior keel; fore tibiae with 5 external and 6 internal ventral spines and 2 to 4 external dorsal spines. Middle legs with meso-femora with 5 to 6 external

teeth on the inferior keel; meso-tibiae with 13 external and 9 internal spines on the ventral keels and with 8 to 9 internal dorsal spines. Caudal femora with 5 to 8 external and 7 to 8 internal large black appressed teeth on the inferior keels; caudal tibiae with 34 to 37 external and 40 to 41 strong internal teeth on the dorsal margins and with 23 to 24 external and 13 internal ventral spines. Ovipositor with truncate arcuate apical portion of the dorsal valvulae bearing 15 crenulate teeth, the largest median in position and graduating to smaller teeth towards each end. Ventral valvulae with 6 large crenulate teeth near the apex, the dorsal margin bearing a row of about 15 erect teeth and one row of 8 widely spaced teeth between this row and the ventral keel of the ventral valvulae. Dorsal valvulae with 5 to 6 disrupted lateral crenulated lines; lower margin with about 21 fine serrate teeth with apices directed caudad and not cephalad as in all the other teeth. Cerci acuminate with incurved acute tip and hairy. Buttresses at the base of the ovipositor pale colored. Subgenital plate equilaterally triangular with a shallow apical notch.

Measurements in millimeters: body length 29; length to tip of ovipositor 36; length to apex of wing 59; pronotum 6; tegmina 47 × 9; hind femora 31.5 mm.

Paratypes.—8 ♂, 12 ♀. 4 ♂, 9 ♀, same data as the type, [Tinkham and Hebard Clns.]. 3 ♂, 3 ♀, Kuling Kiangsi Province, Central China, August 10 to September 14, 1934 to 1935, (O. Piel), [Heude Museum Cln.]. 1 ♂, Suifu, Szechwan, September to October, 1921, (D. C. Graham), [U. S. National Museum Cln.].

Measurements of paratypes in millimeters: males, body length to apex of genitalia 26 to 28, pronotum 5.8 to 6, tegmina 43 to 46, hind femora 28.5 to 26.5; females, length to tip of ovipositor 33 to 34, pronotum 6 to 6.8, tegmina 43 to 48, hind femora 28 to 32.

Distribution.—This species is known from the mountain range forming the northern boundary of Kwangtung Province north to Kuling mountain in the northern part of Kiangsi Province, west to Sufu in Szechwan Province.

Sinochlora szechwanensis new species.

(Pl. VI, fig. 2, 6; pl. VII, fig. 4, 5.)

An average sized species distinguished by the long recurving arms of the subgenital plate in the male; from *kiangsuensis,* which it closely resembles, these arms are slightly shorter and the median process of the supra-anal plate is elevated above the plane of the lateral processes of the plate. In *kiangsuensis* the median and lateral processes of the supra-anal plate are on the same plane.

The female of *S. szechwanensis* differs from the closely similar female of *S. kiangsuensis* by the heavier spination on all the femora.

Type.—♂; Kwanhsien, Szechwan Province, western China. August 17, 1930. (D. C. Graham.) [Hebard Collection, Type no. 1366.]

Description.—Size medium and form typical of the genus. Leg spination as follows: fore legs with 6 to 7 short black appressed teeth on the internal inferior keel of the fore femora; fore tibiae with 4 external and 4 to 5 internal small spines on the ventral surface and without spines on the dorsal surface. Middle legs with meso-femora bearing 4 to 6 teeth on the external inferior keel; meso-tibiae with 7 external and 5 to 6 internal spines on the ventral keels and with 1 to 2 spines on the internal margin of the dorsal side. Caudal femora with 9 to 10 external large teeth and 10 to 11 internal teeth on the inferior keels; caudal tibiae with 22 to 24 external and 30 to 31 internal teeth on the dorsal keels and with 17 external and 9 to 11 internal spines on the ventral keels. Supra-anal plate with the lateral forcipate processes gently decurved in the apical half with the median raised area of the plate bearing a broadly sulcate central groove. Subgenital plate broad at the base and very deeply cleft; the long arms strongly recurved and terminated with minute apical styli. Cerci long, acuminate, with the apical third slightly recurved with the apex acutely tipped. Epiprocts with a lower rounded process armed with long black heavy bristles and an upward projecting bipronged process projecting dorsad of the median tumid area of the supra-anal plate.

Measurements in millimeters: body length 23, length to tip of wing 51, pronotum 5.5, tegmina 42 × 9, hind femora 26 mm.

Allotype.—♀; Mt. Omei, Baian-Kara-Ula Range, Szechwan Province, western China; elev. 4000 feet. August 7, 1931. (D. C. Graham.) [Hebard Collection.]

Description.—Size slightly larger than the type and heavier but otherwise similar in appearance. Leg spination as follows: fore legs with 3 to 5 teeth on the internal inferior keel of the fore femora; fore tibiae with 2 external and 4 to 5 internal spines on the ventral keels and with only one external median spine on the dorsal side. Middle legs with 4 to 5 external teeth on the inferior keel of the meso-femora; meso-tibiae with 8 to 9 external and 6 internal spines on the ventral keels and 5 internal spines on the dorsal side. Caudal femora with 8 external and 7 internal teeth on the inferior margins; caudal tibiae with 30 external and 33 internal teeth on the dorsal keels and 23 to 25 external appressed and 11 long appressed internal spines on the ventral surface.

Ovipositor with the arcuate and truncate apex of the dorsal valvulae bearing 10 to 11 crenulate teeth. Ventral valvulae with only 3 or 4 pairs of

large uncinate teeth near the apex followed by much smaller ones; the piceous apical third also bears 4 or 5 lateral rows of poorly defined teeth. Dorsal with large piceous buttresses at the base. Cerci long, acuminate with the apical half slightly incurved and clothed with long pale hairs. Subgenital plate isosceles-triangular with a small triangular apical notch.

Measurements in millimeters: body length 24, length to tip of ovipositor 32, length to apex of wings 59, pronotum 6.5, tegmina 49 × 10, hind femora 31 mm.

PARATYPES.—3 ♂, 8 ♀; similar to the type and allotype. 1 ♂, Kwanhsien, August 17, 1930; 1 ♂, Mt. Omei, August 7, 1931; [Hebard Cln.]. 1 ♂, Mt. Omei, August 11, 1931, (D. C. Graham); 1 ♂, Suifu, Szechwan, (D. C. Graham); 1 ♂, Beh Luh Din, 30 miles north of Chengtu, elev. about 6000 feet, August 11, 1933, (D. C. Graham); [U. S. National Museum Cln.]. 5 ♀, Mt. Omei, July 7 to August 7, 1929 to 1930, (D. C. Graham), [Hebard Cln.]. 2 ♀, Kwanhsien, August 6 to 17, 1930, (D. C. Graham), [U. S. National Museum Cln.]. 1 ♀, Mt. Omei, August 7 to 19, 1931, (D. C. Graham), [U. S. National Museum Cln.].

Measurements of paratypes in millimeters: Males; body length 25, pronotum 5.4 to 6, tegmina 43 to 44.5, hind femora 25.5 to 27.7. Females; length to tip of ovipositor 32.5 to 33, pronotum 6.5 to 6.8, tegmina 45.5 to 48.5, hind femora 28.6 to 30.5.

Distribution.—Sinochlora szechwanensis is at present known from a few localities in the Chinese province of Szechwan.

Sinochlora kiangsuensis new species. (Pl. VI, fig. 3, 5; pl. VII, fig. 2, 9.)

A moderately sized species, characterized by the broad and flat supra-anal plate (seen in profile) lacking the raised median swelling between the lateral forcipate processes of the plate. Female characterized by the few teeth on the femora of all legs. *S. kiangsuensis* is most closely allied to *S. szechwanensis,* from which it differs in the male by lacking the median swelling between the lateral processes of the supra-anal plate and in the female by the very few and minute, widely-spaced teeth on the femora of all legs.

Type.—♂; Soochow, Kiangsu province, central China. August 4, 1918. (E. Suenson.) [Hebard Collection, Type no. 1367.]

Description.—Size moderately large and form typical for the genus. Leg spination as follows: fore legs with the fore femora bearings 3 to 6 teeth on

the inferior internal keel; fore tibiae with 4 to 6 external and 5 internal spines on the ventral keels and with 1 to 3 dorsal spines. Middle legs with 4 to 5 external teeth on the inferior keel of the meso-femora; meso-tibiae with 9 to 10 external and 7 to 10 internal teeth on the ventral keels; and 2 to 3 external and 7 to 9 internal dorsal spines. Caudal femora with 26 external and 29 internal teeth on the dorsal keels and 19 to 22 external and 10 to 14 internal teeth which are crowded apically.

Supra-anal plate flat and broad with short lateral incurved arms and without tumid median process. Cerci long, acuminate, hairy, and gently incurved in the apical half. Epiprocts large with the lower outer angle bearing a group of strong dark bristles and the upper apex bifurcate into two short stout prongs, and capable of passing upward between the lateral processes of the supra-anal plate. Subgenital plate large and very broad at the base, tapering rapidly and deeply cleft to the middle, the arms long and circularly reflexed and terminated by minute apical styli.

Measurements in millimeters: length to apex of genitalia 33, length to tip of wings 55, pronotum 6.5, tegmina 44 × 9.5, hind femur 27.5 mm.

Allotype.—♀; same date as the type but collected July 28, 1918; [Hebard Collection].

Description.—Size average and form typical for the genus. Leg spination as follows: fore legs with fore femora bearing 5 external teeth on the inferior keel; fore tibiae with 3 external and 3 internal teeth on the ventral keels and with 2 dorsal teeth. Middle legs with 4 to 5 external, strongly appressed teeth on the inferior keel of the meso-femora; meso-tibiae with 12 external and 7 internal teeth on the ventral keels and 1 external and 4 internal dorsal teeth. Caudal femora with 6 external and 5 internal teeth on the inferior keels; caudal tibiae with 25 external and 29 internal teeth on the dorsal keels and 19 to 21 external and 13 to 14 internal ventral teeth.

Ovipositor with the arcuate truncate portion of the dorsal valvulae bearing 13 teeth and with 5 to 6 lateral teeth rows running parallel to the ventral margin, the lowermost row near the ventral margin longest with the rows above becoming progressively shorter; this apical area piceous in coloration. Ventral valvulae with approximately 14 teeth on the lower edge and with a row of teeth edging the upper margin of the ventral valvulae. Buttresses at the base of the ovipositor concolorous with the ovipositor. Subgenital plate large, equilaterally triangular with a strong median carina and a small apical triangular notch.

Measurements in millimeters: length to apex of genitalia 26, length to tip of wing 56.5, pronotum 6.5, tegmina 45 × 9.5, hind femur 27.5.

Paratype.—♂, similar to the type in every respect. Zose, Shanghai, Kiangsu Province, central China, July 12, 1930, (O. Piel). [Heude Museum of L'Aurora University, Shanghai, China].

Distribution.—*Sinochlora kiangsuensis* is at present known only from Shanghai and Soochow in Kiangsu Province of east central China.

Sinochlora hainanensis new species (Pl. VII, fig. 8, 13.)

Size considerably larger than any other species of the genus and known only from the unique type, a female.

Type.—♀; Taipingt'seun (Dwa Bi), Hainan Island, S. China, elev. 300 meters. July 28, 1935. (J. L. Gressitt.) [Tinkham Collection.]

Description.—General features of *Sinochlora* characterized by its very large size. Leg spination as follows: fore femora with 5 to 6 strong black teeth on the internal inferior keel; fore tibiae with 5 pairs of pale brown slender spines on the ventral surface and 4 single spines on the dorsal side, the basal one on the distal portions of the tympanum. Meso-femora with 4 black appressed teeth on the external inferior keel; meso-tibiae with 8 internal and 13 external ventral spines and 8 internal and 1 external dorsal spines. Caudal femora with 4 internal and 7 external black appressed teeth on the lower keels; caudal tibiae with 38 to 40 strong teeth on the dorsal keels and 24 external and 12 to 13 internal spines on the ventral keels. Ovipositor large and strong with about 12 strong falcate teeth on the dorsal valvulae; ventral valvulae with numerous small teeth in the apical half, those nearest the apex large and strong.

Measurements in millimeters: body length to tip of ovipositor 38, pronotum 7.2, tegmina 52, hind femora 32, ovipositor 15, antennae 104.

Distribution.—*Sinochlora hainanensis* inhabits the lower elevations of the Five Finger mountains in the central portions of Hainan Island.

Sinochlora sinensis new species. (Pl. VI, fig. 4; pl. VII, fig. 3, 7, 11, 12.)

Size average for the genus, the male is quickly distinguished from the other males of the genus by the long apically produced process of the supra-anal plate, the female from other females of *Sinochlora* by the large rectangular subgenital plate which is deeply triangularly excised. *S. sinensis* is not only the most distinctive and easily recognized species of the genus but it is also the most aberrant member. There are, however, no characters of generic value which might be used to separate this species as a new genus from other species of the new genus *Sinochlora*.

Type.—♂; Sha Lo Shan, Lung Moon District, central Kwangtung Province, South China. July 9, 1938. (Mr. Hai Tsz.) [Tinkham Collection.]

Description.—Form and size average for the genus; coloration deep foliage green with the diagnostic black and white costal vein of the tegmina. Leg spination as follows: fore legs with the fore femora bearing 5 black slanting teeth on the lower internal keel; fore tibiae with 5 external and 6 internal small slender spines on the ventral surface and 6 external spines on the dorsal side. Middle legs with meso-femora with 4 to 5 external teeth on the inferior keels; meso-tibiae with 6 internal and external spines on the ventral keels and 5 external and 7 internal spines on the dorsal side. Hind legs with caudal femora bearing 8 external and 8 to 9 internal teeth on the inferior keels; caudal tibiae with 30 to 31 external and 35 to 36 internal teeth on the dorsal keels and 25 external and 17 internal spines on the ventral side. Genitalia distinctive, the median process of the supra-anal plate lengthily extenuate for almost 5 mms., the process narrow with slightly subparallel margins. Lateral processes of the plate represented by small denticulate projections near the base. Cerci long and slightly recurved, tapering with acute tip. Epiprocts long, slightly recurved, the apices resting under the long produced appendage of the supra-anal plate. Subgenital plate with strong lateral constriction beyond the base, the apical half cleft, the arms moderately separated and very slightly incurved apically, the apices bearing short styli.

Measurements in millimeters: body length 27, pronotum 6.5, tegmina 46, hind femora 28.5, antennae 90.

Allotype.—♀; same data as the type; [Tinkham Collection].

Description.—Slightly larger and heavier than the type but otherwise closely similar in general features. Leg spination as follows: fore legs with 5 internal teeth on the inferior keel of the fore femora; fore tibiae with 6 external and 5 to 6 internal spines on the ventral side and 3 external spines on the dorsal surface. Middle legs with 4 external teeth on the inferior keel of the meso-femora; meso-tibiae with 12 external and 6 to 7 internal spines on the ventral keels and 1 external and 7 to 8 internal spines on the dorsal side. Hind legs with caudal femora armed with 6 to 7 external and 6 internal teeth on the inferior keels; caudal tibiae with 30 to 32 external and 33 to 36 internal teeth on the dorsal keels and 23 to 24 external and 13 to 14 internal spines on the ventral side, the spines crowded apically. Subgenital plate large, quadrangular with a large and deep triangular notch on the posterior margin. Truncate apical portions of the dorsal valvulae of the ovipositor with 15 to 16 crenulated teeth and with 4 to 5 teeth rows on the lateral surfaces. Ventral valvulae with 3 rows of teeth, the upper row along the groove of the valvulae with about 16 large downward projecting teeth, the other rows with fewer and smaller teeth.

Measurements in millimeters: body length 28.5, length to tip of ovipositor 34.5, pronotum 6.8, tegmina 46.5, hind femur 21.

Paratypes: 26 ♂, 29 ♀.—KWANGTUNG: 14 ♂, 14 ♀, Sha Lo Shan and vicinity, Lung Moon District, July 6 to 21, 1938, (Mr. Hai Tsz); 2 ♂, Maan Chi Shan, northern Kwangtung, October to December, (C. W. Howard); [Hebard Cln.].

SOUTHERN KIANGSI: 5 ♂, 5 ♀, Tai Au Hong, elev. 530 meters, July 5 to 7, 1931, (J. L. Gressitt); 3 ♂, 3 ♀, Wong Sa Shui, elev. 540 meters, July 8 to 9, 1936, (J. L. Gressitt); 1 ♀, Hong Shan, July 15, 1936, (J. L. Gressitt); [Tinkham Cln.].

SOUTHERN FUKIEN: 1 ♂, Gongkau, July 28, 1936, (J. L. Gressitt).

YUNNAN: 1 ♂, 1 ♀, Chao Tung, July to August, 1934, (D. C. Graham); [U. S. National Museum Cln.].

SZECHWAN: 3 ♀, Mt. Omei, Shin Kai Si, elev. 4400 feet, (D. C. Graham); 1 ♀, Kwanhsien, elev. 3000 feet, September 10 to 20, 1934, (D. C. Graham); 1 ♀, Szechwan, 1933, (D. C. Graham); [U. S. National Museum Cln.].

Distribution.—Known from the mountains of central and northern Kwangtung, southeastern Kiangsi and southwestern Fukien west through the mountain systems to Yunnan and Szechwan.

EXPLANATION OF FIGURES

PLATE VI

All figures greatly enlarged and on the same scale.

Fig. 1.—*Sinochlora kwangtungensis* new species. Type. Male. Maan Chi Shan, Kwangtung, China. Lateral view of genitalia.

Fig. 2.—*Sinochlora szechwanensis* new species. Type. Male. Kwanhsien, Szechwan, China. Lateral view of genitalia.

Fig. 3.—*Shinochlora kiangsuensis* new species. Type. Male. Soochow, Kiangsu, China. Lateral view of genitalia.

Fig. 4.—*Sinochlora sinensis* new species. Type. Male, Sha Lo Shan, Kwangtung, China. Lateral view of genitalia.

Fig. 5.—*Sinochlora kiangsuensis* new species. Type. Male. Soochow, Kiangsu, China. Dorsal view of supra-anal plate.

Fig. 6.—*Sinochlora szechwanensis* new species. Type. Male. Kwanhsien, Szechwan, China. Dorsal view of supra-anal plate.

Fig. 7.—*Sinochlora kwangtungensis* new species. Type. Male. Sha Lo Shan, Kwangtung, China. Dorsal view of supra-anal plate.

Plate VII

All figures greatly enlarged and on the same scale.

Fig. 1.—*Sinochlora kwangtungensis* new species. Type. Male. Maan Chi Shan, Kwangtung, China. Ventral view of subgenital plate.

Fig. 2.—*Sinochlora kiangsuensis* new species. Type. Male. Soochow, Kiangsu, China. Ventral view of subgenital plate.

Fig. 3.—*Sinochlora sinensis* new species. Type. Male. Sha Lo Shan, Kwangtung, China. Ventral view of subgenital plate.

Fig. 4.—*Sinochlora szechwanensis* new species. Type. Male. Kwanhsien, Szechwan, China. Ventral view of subgenital plate.

Fig. 5.—*Sinochlora szechwanensis* new species. Allotype. Female. Mt. Omei, Szechwan, China. Ventral view of subgenital plate.

Fig. 6.—*Holochlora japonica* Brunner. Female. Ihing, Kiangsu, China. Lateral view of ovipositor.

Fig. 7.—*Sinochlora sinensis* new species. Type. Male. Sha Lo Shan, Kwangtung, China. Lateral view of pronotum and base of tegmen.

Fig. 8.—*Sinochlora hainanensis* new species. Type. Female. Taipingt-'seun, Hainan Island, China. Ventral view of subgenital plate.

Fig. 9.—*Sinochlora kiangsuensis* new species. Allotype. Female. Soochow, Kiangsu, China. Ventral view of subgenital plate.

Fig. 10.—*Sinochlora kwangtungensis* new species. Allotype. Female. Maan Chi Shan, Kwangtung, China. Ventral view of subgenital plate.

Fig. 11.—*Sinochlora sinensis* new species. Allotype. Female. Sha Lo Shan, Kwangtung, China. Ventral view of subgenital plate.

Fig. 12.—*Sinochlora sinensis* new species. Allotype. Female. Sha Lo Shan, Kwangtung, China. Lateral view of ovipositor.

Fig. 13.—*Sinochlora hainanensis* new species. Type. Female. Taipingt-'seun, Hainan Island, China. Lateral view of ovipositor.

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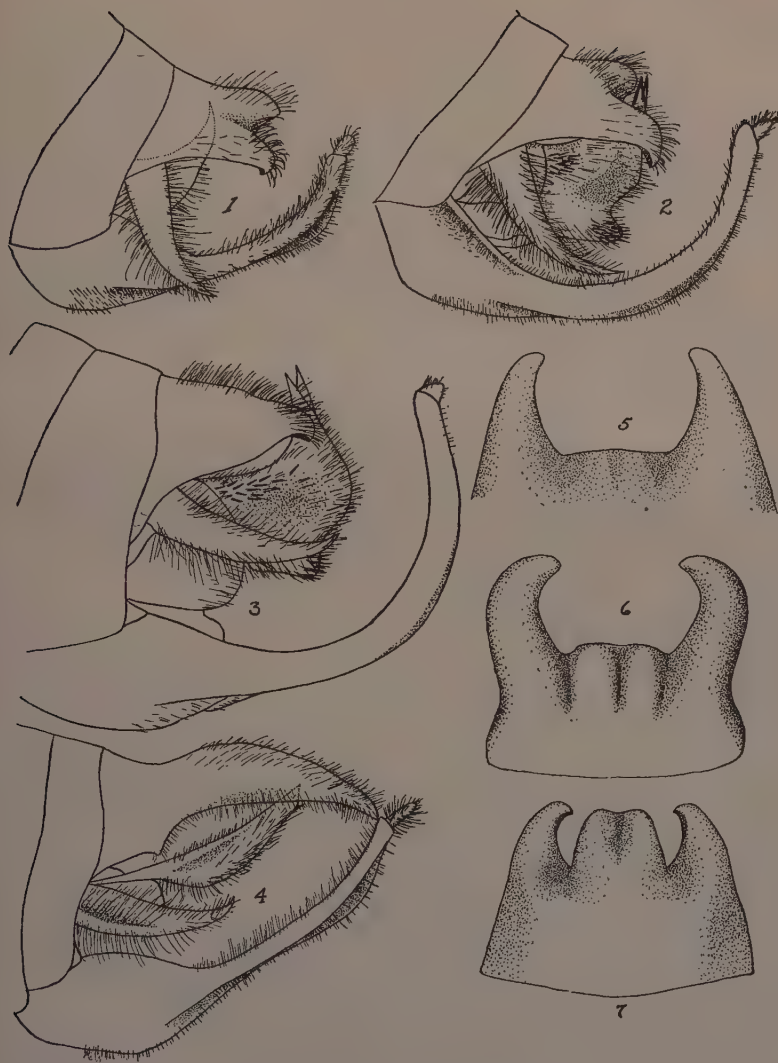
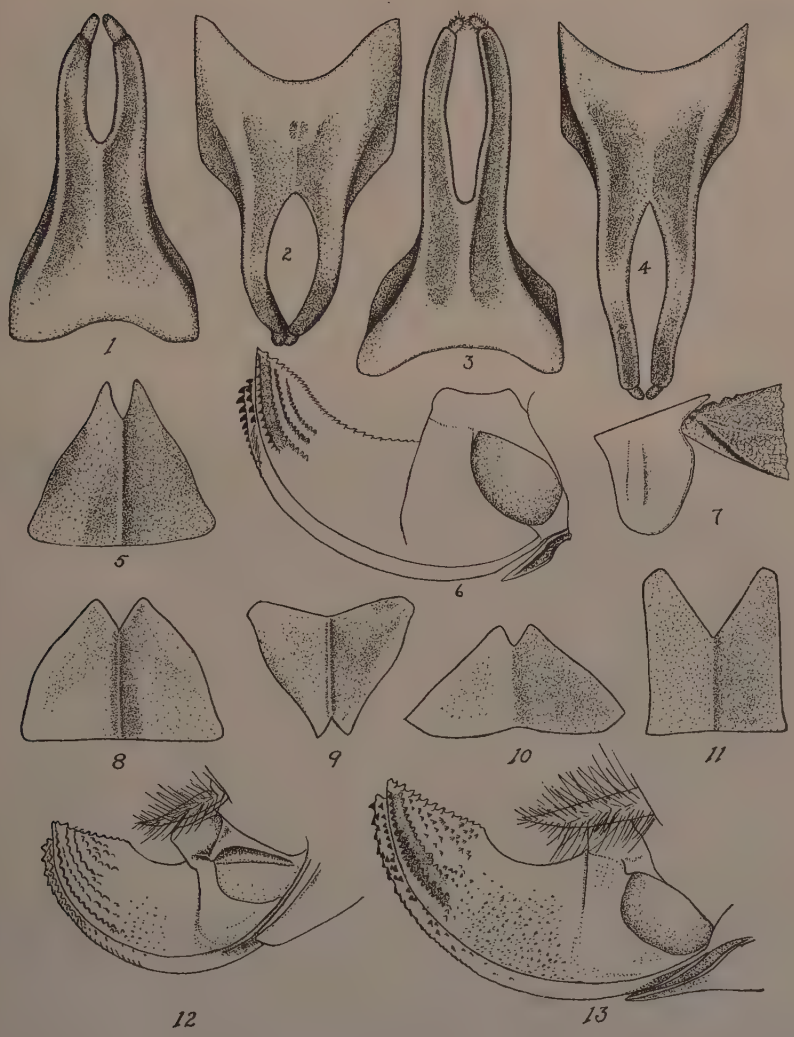


TINKHAM—SINOCHLORA



TINKHAM—SINOCHLORA

INDEX

New names are followed by the name of the author within parentheses ( ). An asterisk * denotes that a figure is referred to on that page. Misidentifications and misspellings are in *italics*.

Acrydium (*see* ensicorne)
adjuncta, Ceropsilopa..... 162
adjunta, Ceropsilopa Cresson.... 162
adspersa, Metaleptea, Truxalis. 229*
advena, Hydrellia..... 165
aequus, Pompilus..... 52
Agenia (*see* azureus)
albocaudata, Pedinaspis..... 79
albocaudatus, Allocyphonyx, Pedinaspis..... 152
aliena, Discocerina..... 161
Allaporus..... 118
(*See also* hesperus, pulchella)
Allochares..... 148
Allocharini (Bradley)..... 147
Allocyphonychini (Bradley).... 150
Allocyphonyx..... 150
Allotruxalis (Rehn)..... 198
Key to species..... 199
alternata, Psorthaspis, Pedinaspis..... 69
americana, Hydrellia..... 164
americanum, Clanoneurum..... 162
anomala, Pedinaspis..... 79
anomalus, Chelaporus, Pedinaspis..... 117*
antennalis, Pedinaspis..... 74
antillarum, Planiceps (Bradley). 107
Aporida..... 79
Aporinae..... 79
Aporini..... 79
Key to genera..... 83
Aporus.....86, 88
Key to species..... 89
(*See also* magna, rufiventris, quadrimaculata, variipennis)
argyrostoma, Ditrichophora, Gymnoclasiopa..... 161
Asemoplus..... 4
(*See also* montanus, rainierensis)
asinus, Paulacris, Hyalopteryx. 189*
Aspidaporus (Bradley)..... 122
assimilis, Aporus, Planiceps..... 91
Athyroglossa..... 160
atroglauca, Hydrellia..... 169
ascita, Hydrellia..... 170
Aulocostethus..... 140
Key to species..... 141
aureolus, Odontaporus (Bradley) 115
auripennis, Dryinus, Planiceps.. 138
australis, Psorthaspis, Pedinaspis 57*
avinoffi, Psorthaspis..... 49*
azteca, *Epipompilus* Ashmead... 142
aztecus, Aulocostethus, Ferreola, Pompilus..... 142
aztecus, *Epipompilus* Haupt.... 146
azureus, Allochares, Pompilus, Agenia, Pseudagenia..... 149*

banksi, Psorthaspis (Bradley)... 55
bellula, Eutryxalis filatus (Rehn)..... 217*
bellus, Rhabdaporus (Bradley).. 121
bequaerti, Aporus, Planiceps... 95
bergi, Hydrellia..... 170
bifasciatus, Aulocostethus..... 145
bilobifera, Hydrellia..... 170
bioculata, Psorthaspis (Bradley) 70
borealis, Hydrellia (Cresson).... 164
Bradynotes..... 5
brevicornis, Metaleptea, Gryllus 224*
brimleyi, Psorthaspis, Pedinaspis 63

bruesi, Allochares..... 149
bucephala, Pedinaspis..... 52
bugabensis, Psorthaspis, Pompilus, Pedinaspis..... 72
burkhartianus, Oxycoryphus.... 224

calcaratus, Aporus, Planiceps... 97
californica, Helaeomyia..... 162
caliginosa, Hydrellia..... 170
calverti, Zeros, Ilythea..... 178
canescens, Aporus, Notoplaniceps, Pompilus..... 101
canescens, *Planiceps* Fox..... 101
caniceps, Ilythea..... 178
canipennis, Psorthaspis (Bradley)..... 71
capucinus, Pompilus..... 79
cariborum, Aporus, Neoplaniceps (Bradley)..... 106
Caudellacris..... 20
Ceropsilopa (*see* adjuncta, adjunta)
Chelaporus (Bradley)..... 116
Chrysochraon Walker..... 206
(*See also* filata)
cimiciformis, *Clanoneurum* Cresson..... 162
Clanoneurum (*see* americanum, cimiciformis)
Clasiopella (*see* dimidiata, girschneri)
Claveliinae..... 30
coelestis, Psorthaspis (Bradley). 46
collaris, Drepanaporus, Planiceps..... 109*
colombiae, Psorthaspis (Bradley) 47
comptus, Odontaporus (Bradley) 116
concolor, Aporus, Planiceps, Pompilus..... 97
conocephala, Psorthaspis (Bradley)..... 67*
contiguus, Parapompilus, Pompilus..... 65
Cosmiaporus (Bradley)..... 108
crassipes, Hydrellia..... 169
cressoni, Psorthaspis (Bradley). 59*
cruralis, Hydrellia..... 169
Cryptocheilus (*see* margaretella)
Ctenoceratini..... 30
cubensis, Planiceps..... 109
cupripennis, Odontaporus, Planiceps..... 111

debilis, Hydrina, Philygria..... 177
decens, Hydrellia..... 170
definita, Hydrellia (Cresson).... 165
delicatus, Epipompilus..... 146
Diclasiopa (*see* lacteipennis)
dimidiata, Psilopa, Clasiopella.. 161
Discocerina (*see* aliena, lacteipennis, obscurella, parva)
Ditrichophora (*see* argyrostoma)
diverticulus, Cosmiaporus, Planiceps..... 108*
Drepanaporus (Bradley)..... 109
Dryinus (*see* auripennis, planifrons)
dupla, Psilopa..... 161
durrenbergensis, *Pelignus* Cresson 160

elegans, Psorthaspis, Pompilus, Pedinaspis..... 74
ensicorne, Acrydium 224
Ephydra (*see* spilota)
Ephygrobia (*see* nigrimana)
Epipompilini..... 139
Key to genera..... 139
Epipompilus..... 145
Key to species..... 145
(*See also* azteca)
eubule, Psorthaspis, Pompilus, Pedinaspis..... 78
euferalis, Odontaporus, Planiceps, Pompilus..... 112
euferalis, *Planiceps* Ashmead... 106
euferatis, Melanaporus Ashmead. 112
Euplaniceps..... 124
Key to species..... 127
Eutryxalis.....198, 206
(*See also* gracilis, minor, strigata)
exaggerata, Paulacris, Hyalopteryx..... 189

excelsus, Aulocostethus (Bradley) 143

falco, Pompilus 109
fenestralis, Aporus, Notoplaniceps (Bradley) 101
fenestralis, Zeros, Ilythea 179
Ferreola (*see* aztecus, formosa, laevifrons, sanguinea, unicolor, variegata)
Ferreola Cresson 32
filata, Eutryxalis, Chrysochraon, Paratruxalis 209*
filatus, Paratruxalis Hebard 217
flava, Psilopa Cresson 161
flaviceps, Ilythea 178
flavicoxalis, Hydrellia (Cresson). 167
flavida, Psilopa 161
flavipes, Zeros, Ilythea 179
formosa, Ferreola Cresson 68
formosa, Hydrellia 163
formosa, Psorthaspis, Ferreola, Pompilus 58
Fruhstorferiola 20
fuscicornis, Philygria 177

girschneri, Clasiopella Cresson .. 161
gracilis, Allotruxalis, Hyalopteryx 200
gracilis, Eutryxalis 203
granulosa, Athyroglossa 160
griseola, Hydrellia, Notiphila ... 166
Gryllus (*see* brevicornis)
Guaranacris (Rehn) 194
guatemalae, Psorthaspis (Bradley) 43
Gymnoclasiopa (*see* argyrostoma)

hainanensis, Sinochlora (Tinkham) 243*
harti, Hydrellia 170
haupti, Aulocostethus 144
Hecamede (*see* xanthocera)
Helaeomyia (*see* californica)
herbertii, Euplaniceps, Planiceps 128
hermes, Aporus (Bradley) 94*
hesperus, Planiceps, Allaporus .. 120
hinei, Plagiopsis, Plagiops 162
hirsutus, Aporus, Plectratporus, Planiceps 99*
hispaniolae, Psorthaspis (Bradley) 50
Holochlora (*see* japonica)
Hyalopteryges 181
Key to genera 185
Hyalopteryx 187, 191, 194, 198
(*See also* asinus, exaggerata, gracilis, rufipennis, specularis)
Hydrellia 163
Key to species 171
Hydrelliini (Cresson) 163
Hydrina 177
Key to species 177
Hydrinini (Cresson) 175
Key to genera 176
Hydrochasma (*see* leucoprocta)
hypoleuca, Hydrellia 166

Idopedinaspis 32
(*See also* laevifrons)
Ilythea 178
Key to species 179
(*See also* calverti, fenestralis, flavipes, obscurus)
Ilytheini 178
Key to genera and species .. 179
impudica, Psorthaspis, Pompilus, Pedinaspis 72
innotatus, Aporus, Notoplaniceps 103
ischiaca, Hydrellia 165

japonica, Holochlora 246*
johnsoni, Hydrellia 164
jugosus, Aspidaporus, Planiceps. 122

kiangsuensis, Sinochlora (Tinkham) 241*
kwangtungensis, Sinochlora (Tinkham) 238*

lacordairii, Euplaniceps, Planiceps, Pompilus 130

lacteipennis, Diclasiopa, Discocerina..... 160
laevifrons, *Parapompilus* Cresson 59
laevifrons, *Pedinaspis* Banks.... 59
laevifrons, Psorthaspis, Ferreola, Pompilus, Idopedinaspis... 45
lamellipes, Hyalopteryx..... 189
legata, Psorthaspis, Pompilus, Parapompilus, Pedinaspis.. 76*
lata, Hydrellia (Cresson)..... 165
Lemnaphila..... 176
Leptopsilopa (*see* nigrimana, varipes)
leucoprocta, Hydrochasma..... 160
levis, Psorthaspis (Bradley).... 43*
luctuosa, Hydrellia..... 170
luctuosa, Psorthaspis, Pedinaspis 76
luxus, Aporus, Planiceps..... 90*

macronotum, Psorthaspis, Pompilus, Pedinaspis..... 44
magna, Psorthaspis, Aporus, Pedinaspis..... 67*
margaretella, Pedinaspis, Cryptocheilus..... 79
mariae, Psorthaspis, Pompilus, Pedinaspis..... 74*
maurus, Allocyphonyx, Pompilus 152
maximilliani, Epipompilus, Pompilus..... 146
melanderi, Athyroglossa, Ochtheroidea..... 160
Melanoporus..... 86
(*See also* euferatis)
Metaleptea..... 222
(*See also* minor)
minimus, Aporus, Pompilus.... 120
minor, Eutryxalis, Metaleptea, Orphula, Paratruxalis..... 214*
minor, *Eutryxalis* Bruner..... 203
minusculus, Aspidaporus (Bradley)..... 123*
minutissimus, Pompilus..... 139
minutus, Aporus..... 139
montanus, Asemoplus.....4, 7*, 21*
morosa, Psorthaspis (Bradley).. 42
morrisoni, Hydrellia..... 168
nahuatlensis, Psorthaspis (Bradley)..... 46*
naomi, Psorthaspis, Parapompilus..... 73
Neoplaniceps (Bradley)..... 104
Key to species..... 104
nigrescens, Hydrina..... 177
nigriceps, Psorthaspis, Pedinaspis..... 51
nigrimana, Ephygrobia..... 161
nigrimana, Leptopsilopa, Psilopa 161
nobilis, Hydrellia, Psilopa..... 164
Nostima..... 176
Key to species..... 177
notabilis, Odontaporus, Planiceps, Pompilus..... 114*
Notiphila (*see* griseola, obscurella, picta)
notiphiloides, Hydrellia..... 170
notochlorus, Truxalis..... 224
Notoplaniceps (Bradley)..... 100
Key to species..... 101

obesa, Bradynotes..... 5
obscurella, Discocerina, Notiphila..... 160
obscuriceps, Hydrellia..... 167
obscurus, Zeros, Ilythea..... 179
Ochtheroidea..... 160
Odontaporus (Bradley)..... 110
Key to species..... 111
olga, Psilopa..... 161
omei, Caudellacris..... 20
Opomala (*see* stenobothroidea)
opposita, Hydrina, Philygria... 177
Opsomala (*see* punctipennis)
ornatula, Euplaniceps, Pompilus 137
ornatus, *Planiceps* Taschenberg. 137
Orphula Giglio-Tos..... 206
(*See also* minor, pagana)
Oxycoryphus (*see* burkhartianus)

pagana, *Orphula* Giglio-Tos.... 209
Parapompilus Cresson..... 32
(*See also* contiguus, laevifrons, legata, naomi, texana, vicina)

Paratruxalis..... 206
(*See also* filata)
parva, Discocerina..... 160
Paulacris (Rehn)..... 187
Pedinaspis Fox..... 32
(*See also* albocaudatus, alternata, anomalus, australis, brimleyi, bugabensis, elegans, eubule, impudica, laevifrons, legata, luctuosa, macronotum, magna, mariae, nigriceps, picta, portiae, purpuripennis, sanguinea, telemon, texana, vicina)
Pelignus (*see* durrenbergensis, salinus)
penicilli, Hydrellia (Cresson)... 168
perpicta, Euplaniceps, Pholidaporus, Planiceps..... 136
petulans, Euplaniceps (Bradley) 133
Philygria (*see* debilis, fuscicornis, opposita)
Philygriola..... 176
Pholidaporus (Bradley)..... 136
(*See also* perpicta)
picta, Nostima, Philygriola, Notiphila..... 176
picta, Psorthaspis, Pompilus, Pedinaspis..... 68
Plagiops..... 162
Plagiopsis..... 162
planata, Psorthaspis, Planiceps, Pompilus..... 52*
Planicepini..... 79
Planiceps Cresson..... 86
Planiceps Fox..... 32
Planiceps Latreille..... 107
(*See also* assimilis, auripennis, bequaerti, calcaratus, canescens, collaris, concolor, cupripennis, diverticulus, euferalis, herbertii, hirsutus, lacordairii, luxus, notabilis, ornatus, perpicta, planata, planifrons, pulchritarsis, saussurei, variipennis, venusta, yavapai)
planifrons, Dryinus, Planiceps.. 139
platygastra, Hydrellia..... 168
Plectraporus (Bradley)..... 97
polaris, Prumna..... 3
Pompilinae, Index to genera and species (see p. 153)
Key to tribes..... 28
Pompilus..... 32
(*See also* aequus, aztecus, azureus, bugabensis, capucinus, concolor, contiguus, elegans, eubule, euferalis, falco, formosa, impudica, lacordairii, laevifrons, legata, macronotum, mariae, maurus, minimus, minutissimus, notabilis, ornatula, picta, planata, pulchritarsis, purpuripennis, quadrimaculata, rufiventricosus, sanguinea, saussurei, sinaloae, texana, trogodytes, variegata, variipennis, venusta, vicina)
portiae, Psorthaspis, Pedinaspis. 56
primnoa, Prumna, Podisma...2, 7*
primnoides, Prumna..... 3
proclinata, Hydrellia..... 165
procteri, Hydrellia..... 169
proctori, Hydrellia Cresson..... 169
prolixus, Aporus, Neoplaniceps (Bradley)..... 105
prudens, Hydrellia..... 164
Prumna..... 3
(*See also* primnoa)
Prumnacris (Rehn & Rehn).... 2
Psammocharinae (*see* Pomplinae)
Pseudagenia (*see* azureus)
Psilopa (*see* dimidiata, dupla, flava, flavida, nigrimana, nobilis, olga, pulchripes, unica, varipes, willistoni)
Psorthaspis..... 32
Key to species..... 37
pulchella, Planiceps, Allaporus.. 120
pulchripes, Psilopa..... 161

119
Tp6

pulchritarsis, Aporus, Pompilus, Planiceps..... 97
pulla, Hydrellia..... 170
punctata, Euplaniceps (Bradley) 131
punctipennis, Opsomala..... 224
purpuripennis, Psorthaspis, Pompilus, Pedinaspis..... 48

quadrimaculata, Euplaniceps, Aporus, Pompilus..... 138
quinquenotata, Nostima, Philygriola..... 176

rainierensis, Prumnacris, Asemoplus..... 10*
Rhabdaporus (Bradley)..... 121
rufipennis, Hyalopteryx..... 193*
rufipennis, *Hyalopteryx* Rehn... 197
rufiventricosus, Pompilus..... 120
rufiventris, Allaporus, Aporus.. 120*

salinus, Pelignus..... 160
sanguinea, Psorthaspis, Ferreola, Pompilus, Pedinaspis..... 65
saussurei, Euplaniceps, Planiceps, Pompilus..... 134*
scapularis, Hydrellia..... 166
scotlandae, Lemnaphila..... 176
scutellaris, Nostima, Philygriola 176
serena, Hydrellia..... 165
sima, Euplaniceps (Bradley).... 133
simulatrix, Odontaporus (Bradley)..... 113
sinaloae, Pompilus..... 149
sinensis, Sinochlora (Tinkham). 243*
Sinochlora (Tinkham)..... 235
Keys to species..... 237
Sophropompilus (*see* tumifrons)
specularis, Guaranacris, Hyalopteryx..... 197*
spilota, Ilythea, Ephydra..... 178
stenobothroidea, Opomala..... 224
strigata, Allotruxalis, Eutryxalis 203*
subnitens, Hydrellia..... 169
szechwanensis, Sinochlora (Tinkham)..... 239*

tarsalis, Aporus, Neoplaniceps, Planiceps..... 104*
telemon, Pompilus, Pedinaspis.. 45
texana, Psorthaspis, Parapompilus, Pompilus, Pedinaspis. 64
tibialis, Hydrellia..... 164
tonkinensis, Fruhstorferiola.... 20
trichaeta, Hydrellia..... 170
trogodytes, Pompilus..... 109
Truxalis aut..... 222
(*See also* adspersa)
tumifrons, Sophropompilus..... 52

unica, Psilopa..... 161
unicolor, Psorthaspis, Ferreola.. 73
ussuriensis, Prumna..... 9

valida, Hydrellia..... 167
varia, Euplaniceps (Bradley)... 129
variegata, Psorthaspis, Ferreola, Pompilus..... 73
variipennis, Euplaniceps, Planiceps, Pompilus..... 138
variipennis, *Planiceps* Spinola, *Aporus* Saussure..... 134
varipes, Leptopsilopa, Psilopa.. 162
venusta, Euplaniceps, Planiceps, Pompilus..... 138
venustus, *Planiceps* Fox..... 121
vicina, Psorthaspis, Parapompilus, Pompilus, Pedinaspis. 61*
vicinus, Zeros..... 178
viridifemorata, Fruhstorferiola.. 20
viridulus, Truxalis..... 224

wilburi, Hydrellia (Cresson) ... 168
willistoni, Psilopa..... 161

xanthocera, Hecamede..... 160

yavapai, Aporus, Planiceps..... 95

zapotecus, Aporus (Bradley).... 96
Zeros..... 178
Key to species..... 179
zikani, Planiceps..... 130